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ABSTRACT

This paper describes a longitudinal comparative study of group and family day care for infants in New York City. Approximately 400 infants from low income, predominantly Black or Hispanic families enrolled in publicly or privately funded, community-sponsored day care programs participated in the study from the time they entered the programs (between 2 and 31 months of age) until they reached approximately 3 years of age. Testing for the study was carried out when the children were approximately 6, 12, 18, and 36 months of age. These children were also compared with a control group of children who entered a day care program between 2 1/2 and 3 years of age. The group and family infant programs were studied and compared in three major areas: (1) children's nutrition, physical health, and growth; (2) children's psychological development (social and cognitive); and (3) family development (the impact of the program on the family). Study results suggested better nutrition and health care for infants in group programs as compared to those in family day care. In terms of psychological development, when differences between the groups did occur, they generally favored the family programs over group day care. On Stanford-Binet performance at 3 years of age, however, the group care children obtained significantly higher scores. The study revealed no significant differences in family development between the groups. Specific policy recommendations for improving infancy day care are included at the end of the study. (BD)

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The New York City Infant Day Care Study

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A Comparative Study of Licensed Group and Family Infant Day Care Programs and the Effects of These Programs on Children and Their Families

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In Cooperation With
New York City Department of Health
New York City Agency for Child Development

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This study could not have been done without the cooperation of the 400 families who volunteered to participate and the hundreds of day care personnel who worked with the children.

The strong and continuing support of the Study Policy Committee, which included representatives from the 51 day care programs was essential during the entire study, from the planning phase to the completion of this Final Report. The more than 75 members of the Policy Committee are listed on pages 7 through 11 of this report.

The New York City Agency for Child Development and the New York City Health Department, collaborated on the study. Key people in these agencies assisted in recruiting day care programs into the study and contributed their knowledge about day care in developing the study methodology, interpreting the results, and making policy recommendations for infant day care on the basis of these findings.

The following nationally recognized specialists served as consultants: Dr. Charles Bauer, Dr. Herbert Birch, Dr. Bettye Caldwell, Dr. Jacob Cohen, Dr. Ludwig Ceismar, Dr. Edna Shapior, and Dr. Burton White.

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The New York City Infant Day Care Study was a large scale, interdisciplinary, longitudinal, comparative field study of 31 licensed publicly and privately funded, community-sponsored group and family infant day care programs in New York City, and the effects of these programs on approximately 400 children and their families.

During the past decade attitudes toward infant day care have been changing in this country. In New York City, for example, from 1959 until 1968 the Health Code specifically prohibited group day care for children under 2 years of age, and family day care for infants was fairly limited. Since the New York City Health Code was changed in 1968 to permit group day care for infants from two months of age, there has been an increase in both group and family infant day care programs here; but the number of babies in these programs falls far short of the need for infant day care.

Bronfenbrenner (1976) reported that in 1974 thirty percent of the married women with children under three years of age in the United States were working; 45 percent of the single-parent mothers with children under three years were working. The proportion of low-income working mothers with infants may be substantially greater.

In a survey of 1,366 families who applied for public day care services in New York City in August 1976, we found that approximately 70 percent of the children, ranging from a few months to seven years of age, had been in private day care outside of their homes before 2½ years of age, while their mothers were working or going to school. Approximately 75 percent of these children were placed for day care outside of the home during the first year of life, with about half of these babies separated from their families before six months of age. Whereas 70 percent of the children whose families applied for public day care were in private day care outside of their homes during the first 2½-3 years of life, only eight percent of the children in public day care programs in New York City in the Fall of 1976 were under three years of age.

While there may be a great need for infant day care in this country, there are many people who strongly oppose such programs. They believe that separating infants from their mothers during the first few years of life and placing them for day care outside of their homes, especially in a group day care setting, will have serious consequences for their psychological development. There are people who consider family day care to be preferable to group day care for babies on the assumption that it provides infants with a more home-like environment where they are more likely to receive the kind of personal individual attention they need. Many people also assume that the later children enter a day care program, the better it is for their psychological development.

Concern has also been expressed that infant day care programs may undermine the family as an institution. Such programs may accelerate radical changes in traditional family roles and relationships, by making it possible for more mothers with infants to join the labor force. Furthermore, by putting babies in day care centers shortly after birth, the "State" may be taking over the important child-rearing function of the family during the individual's early formative years, thereby undermining the family's influence on children.

On the other hand, proponents of infant day care programs point out that without such programs many low-income working mothers often have to resort to make-shift, unsatisfactory private child care arrangements for their babies outside of the home, where the care may be custodial at best. Proponents of infant day care view these programs as more than a babysitting service for working mothers. They believe that such programs can provide infants from low-income families (who constitute the majority of the public day care population) with the kind of educational experience, nutrition, and health care which they may not receive at home and are not likely to receive in most private day care settings. Infant day care programs may be used to prevent the kinds of educational and health problems which low-income children in our society often manifest later.

While both professional and lay people often take strong opposing positions on these issues, there is very little direct research evidence for or against these views. The purpose of the present study was to provide empirical data on these issues.

More specifically, the study was designed to answer the following basic research questions:

(1) Do group and family infant day care programs differ in the psychological experiences, nutrition, and health care provided to children?

(2) Does it make a difference to children's development whether they are cared for in a group day care center, a family day care home, or are reared at home by their own families during the first three years of life?

(3) Does the age at which children enter a day care program make a difference to their development?

(4) Does the type of infant day care program or length of time in the program make a difference to the family's socio-economic status and economic resources, as well as other aspects of family functioning, such as interpersonal relationships, child rearing practices, etc.?

In terms of research evidence, the negative attitudes toward infant day care programs, and particularly group day care for babies, are largely based on studies reported by Bowlby (1952), Goldfarb (1945), and Spitz (1945) more than 25 years ago on the serious, apparently permanent psychological damage to children reared in orphanages during the first few years of life. However, these studies were carried out on infants in residential institutions, where children were completely separated from their families, and not on babies in day care who lived with their families.

During the past few years there have been a few studies reported in the literature which indicate that children with group day care experience during the first few years of life develop as well and in some cases develop better than similar children reared at home by their own families or children in family day care homes (Caldwell, 1970; Heber, et al, 1972; Saunders and Keister, 1972; Kagan, 1976; Ricciuti, 1976).

Although such studies contribute to our knowledge about the effects of infant day care experience on children's development, the extent to which the results from this research can be generalized may be limited. The studies were based on relatively small numbers of children in a few research-oriented, academically-based, model day care centers, where babies received a great deal of enrichment. They tended to focus on the effects of infant day care on children's psychological development, but did not generally study the impact of infant day care on children's physical health and growth, or how the programs affected families. Furthermore, the programs themselves were usually not studied to any great extent, which would make it possible to identify the specific kinds of experiences that facilitate children's development.

In contrast to other studies, the New York City Infant Day Care Study was a large-scale, interdisciplinary, comparative study of licensed service-oriented, publicly and privately funded, community-sponsored group and family infant day care programs, and their effects on both children and families. Approximately 400 children and their families, 11 group infant day care programs, 20 family infant day care programs, and more than 100 satellite family day care homes participated in the study. In addition, 21 preschool day care programs, which were not studied, participated in the study by providing three year old children without previous day care experience, who were compared to the infant day care sample on various aspects of development. Infant day care programs and their effects were compared in terms of children's psychological development; children's nutrition, physical health and growth; as well as the impact of day care on families.

Without prejuding the quality of the infant day care programs in the study, all of which were relatively new programs, they were more likely to be typical or representative of service-oriented public group and family infant day care programs in this country than the model programs described earlier. Hence, it may be possible to make more valid generalizations about group and family infant day care programs and their effects on children and families from this study than from studies of model programs.

The New York City Infant Day Care Study was a large-scale study in another important sense. Many organizations and people participated in the study in various ways:

The study, which began in 1970 and was completed in 1977, was supported by grants from several public and privated funding agencies. It was initially supported by a one-year planning grant from the Fund of the City of New York, from 1969 until 1970. The major source of financial support for the study was provided by the Maternal and Child Health Services (MCHS) of the United States Department of Health, Education and Welfare. The MCHS grant covered the period from 1971 until 1977. There were two other important sources of funding for the study. The Office of Child Development (OCD) of HEW provided supplementary funds from 1972 until 1974, for the purpose of developing the naturalistic observation procedures which were used in studying the infant day care programs. The Carnegie Corporation provided funds from 1975 until 1977 for the following purposes: to develop a comprehensive battery of 36-month psychological outcome measures and to collect this data; to contribute to the cost of analyzing all of the data in the study; and to pay for the cost of preparing a draft of a book on the infant day care study.

The study was carried out in cooperation with the New York City Agency for Child Development (ACD), under whose umbrella both group and family public day care programs here are funded and operated; the New York City Health Department, which has the responsibility of setting standards and licensing group day care centers; and the 52 relatively autonomous day care programs in the study. The study was administered by the Medical and Health Research Association (MHRA) of New York City, Inc., a private, non-profit corporation. In addition to the Principal Investigator, the project has had two Co-Investigators, one representing the Agency for Child Development and the other representing the Health Department.

Basic to the success of the study was the research partnership which was established between the study staff, the Agency for Child Development, the Health Department, and the 52 day care programs that participated in the study. This was accomplished through the Study Policy Committee, which was formed at the beginning of the study. Each day care program in the study was represented on the Policy Committee by one or two people, usually the Director and a member of the Board. The Agency for Child Development and Health Department were represented on the Policy Committee. In addition, a few key members of the research team were also on the Policy Committee. (A list of Policy Committee members is included in Table 1-1.)[1].

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[1]. All tables and page numbers are listed at the beginning of this report.

The Policy Committee, which included more than 75 members, played an active role in all phases of the study: from planning the design and methods to be used to interpreting and reporting the results of the study. The Policy Committee met several times a year over a six-year period to discuss the study. The research staff made a commitment to the Policy Committee that its members would have complete access to all information about the study, that study procedures would not be carried out without their approval, and that results from the study would not be reported publicly until the Committee had an opportunity to discuss and contribute their ideas.

The New York City Infant Day Care Study was unique to the extent that, through the Policy Committee, it was a community-controlled study. This report reflects the collective effort and wisdom of the Policy Committee, which speaks for the infant day care community in New York City.

In reading this report, it is important to keep the following facts in mind:

The infant day care programs were still in their infancy when we began to study them. While some programs had been operating for several years, most of the group infant day care programs were not much older than the babies we were studying.

It is ironic that the study was older and has outlasted several of the group infant day care programs in the study. When the study began more than six years ago, only a few group infant day care centers were open, but 47 additional infant day care centers were being planned. There was an air of excitement and optimism about these new programs. However, a total of only 16 infant day care centers opened in New York City during the next few years; and these group programs never served more than 400 children under three years of age at any one time. This contrasts sharply with the more than 25,000 preschool children, from three to six years of age, enrolled in more than 400 day care centers in New York City during the same period. In July 1976 half of the group infant day care programs here were closed because of the fiscal crisis in New York City, including four of the programs in the study. This left only eight group infant day care programs operating, serving less than 300 children. However, the few remaining group day care programs may still be in jeopardy, for financial reasons.

The family infant day care programs in New York City have not fared much better. Because of the fiscal crisis, since April 1976 there has been a freeze on all intake into family day care programs funded by the Agency for Child Development. Several hundred provider-mothers lost their positions, and many of them again became completely dependent on public assistance. The number of infants in these family day care programs, which in the past had provided care for several thousand children under three years of age, is rapidly dwindling.

People who work in the infant day care programs here are demoralized and the future of infant day care in New York City is uncertain. These were the conditions under which the New York City Infant Day Care Study began and ended.

Table 1-1

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CHAPTER 2 - STUDY DESIGN, METHODS, AND DATA ANALYTIC PROCEDURES

The study was designed to compare 11 group and 20 family day care programs, and the effects of these programs on several hundred children and their families.

Children who entered a group or family day care program between two and 21 months of age were studied longitudinally until three years of age. In addition, children who were reared at home by their own families during the first 2½-3 years of life and first entered a day care program at this time were cross-sectionally compared to the longitudinal infant day care children on various aspect of development at about three years of age. These children, whom we refer to as the Thirty-Six Month Cross-Sectional Sample, constitute a comparison group without any previous substitute infant day care experience.

Group and family infant day care programs and their effects were studied in three major areas: (I) Children's Nutrition, Physical Health, and Growth; (II) Children's Psychological Development, which included their cognitive, language, social, and emotional functioning; and (III) Family Development, which was concerned with the impact of infant day care services on the families, as well as on relationships between families and children.

In addition to evaluating the effects of infant day care on children and families, the programs were also studied, particularly those aspects of the program concerned with the nutrition, health care, and psychological experiences provided to children. While the group and family infant day care programs were, of course, compared to see if they differed in these respects, for us the critical question was whether differences between the two types of day care programs made a difference to children's development.

We also studied the relationships between children's individual infant day care experiences and relevant aspects of their development to find out what specific kinds of experiences facilitate children's development, regardless of the type of day care program. Such information may be used to improve both types of infant day care programs in the future.

Although the specific methods used in the study will be described in greater detail in later sections of this report, we will briefly summarize them here. (See Table 2-1 for Summary of Study Procedures).

Various aspects of children's development were evaluated at approximately 6, 12, 18, and 36 months of age. In assessing children's psychological development, we relied primarily on the Bayley Mental Scale at 6, 12, and 18 months. At 36 months of age, we employed a more comprehensive battery of psychological assessment procedures, which required two full mornings to complete for each sample child. These included standardized tests, such as the Stanford-Binet Intelligence Scale and the Peabody Picture Vocabulary Test. In addition, behavior ratings of children's cognitive, language, social, and emotional functioning were made on the basis of a standard play interview and naturalistic observations of each sample child in his or her usual day care setting. Hispanic children, who comprised about 40 percent of the sample, were evaluated by Examiners who were fluent in both English and Spanish.

In assessing children's nutritional status, physical health, and growth we used the following procedures. Birth histories and neonatal data were obtained from hospital records on as many sample children as possible. Comprehensive pediatric examinations were carried out by physicians on our research staff of each child in the study at about 6, 12, 18, and 36 months of age. The 36-month examination included visual, hearing, and dental screening. The pediatricians used detailed, systematic protocols for carrying out these examinations and recording their findings. During the examinations, the doctors also obtained blood samples, which were processed by the New York City Health Department laboratory. The laboratory tested the blood samples for iron deficiency and sickle cell anemia, and for lead poisoning. The laboratory provided a written report of the findings on each sample child to the study Medical Director.

Family development was evaluated on the basis of comprehensive interviews with adult members of the immediate family on two occasions: (1) when the child first entered the day care program; and (2) when the child was three years of age. Families were assessed on the following measures: (a) the Hollingshead Two-Factor Index of Social Position, which determines the family's socio-economic status on the basis of the parents' education and occupation; (b) the family's Total Annual Rate of Income; (c) Income from Wages Only; (d) Source(s) of Income (i.e. wages, public assistance, or both); and (e) the St. Paul Profile of Family Functioning, which assesses family functioning in nine major areas, such as family relationships, care and training of children, etc. The family interviews were also used to obtain demographic information, such as family structure, size, and mother's age when the sample child was born.

The initial psychological and pediatric examinations, which were carried out at about 6, 12, and 18 months of age, provided baseline measures on the longitudinal infant day care children, which were statistically taken into account when assessing the subsequent effects of the program on various aspects of children's development. However, the initial examinations were not carried out immediately after the children entered the program, but at the following age ranges: (1) Children who entered the program between two and nine months of age were first evaluated between six and nine months; (2) children who entered the program between 10 and 14 months were first evaluated between 12 and 14 months; and (3) children who entered the program between 15 and 21 months were first evaluated between 18 and 21 months of age. The Thirty-Six Month Cross-Sectional children who first entered a day care program between 30 and 40 months of age, were evaluated only once between 36 and 42 months of age. In all cases, the first examination was not scheduled until children had been in the program for at least a month to give them an opportunity to adapt to their new day care environment. Since children had been in the program for varying amounts of time before their initial psychological and pediatric examinations, which may have affected the results to some extent, we statistically controlled for age of entry into the program when analyzing this data.

In assessing the effects of infant day care on children's development, we distinguished between the following two periods: (1) the first 18 months of life, which represents the sensorimotor or preverbal period; and (2) from 18 to 36 months of age, when language plays a relatively more important role in children's experience and behavior. The effects of day care on children's development were assessed at two key ages: at approximately 18 and 36 months of age.

At about 18 month of age, we compared the following three groups of children on various aspects of development: (1) the Eighteen-Month Longitudinal Group Day Care Sample consisted of children who entered a group day care program between two and 14 months of age; (2) the Eighteen-Month Longitudinal Family Day Care Sample consisted of children who entered a family day care program between two and 14 months of age; and (3) the Eighteen-Month Cross-Sectional Sample consisted of children who entered a group or family day care program between 15 and 21 months of age.

At about 36 months of age, we compared the following three groups of children on various aspects of development: (1) the Thirty-Six Month Longitudinal Group Day Care Sample[1] consisted of children who entered a group day care program between two and 21 months of age; (2) the Thirty-Six Month Longitudinal Family Day Care Sample consisted of children who entered a family day care program between two and 21 months of age; and (3) the Thirty-Six Month Cross-Sectional Sample consisted of children who were reared at home by their own families during the first 2½-3 years of life and first entered a day care program at that time.

The 18 and 36 month developmental outcome measures were statistically analyzed longitudinally and cross-sectionally. For the 18-month longitudinal analyses, we compared the 18-month longitudinal group and family day care samples, statistically controlling for differences in their initial or baseline measures. For example, in comparing the 18-month Bayley Mental Scores of the two longitudinal samples, we controlled for differences in their initial Bayley scores, which were obtained at six or 12 months of age. For the 18-month cross-sectional analyses, we compared all three groups of children on the 18-month measures, without controlling for earlier initial differences, since such measures were not available on the 18-month cross-sectional sample. However, we were able to control for other initial differences among the three 18-month samples, such as ethnicity, birth history, etc., which were not subject to change.

We followed essentially the same procedures for the 36-month longitudinal and cross-sectional analyses, except that for the longitudinal analyses we statistically controlled for differences in the 18 month rather than the initial measures. There were several reasons for doing this. The 18-month measures were, of course, obtained at about the same age for all children in the 36-month longitudinal samples, and provided a baseline measure of their functioning at the beginning of the verbal period. Furthermore, whereas we were unable to obtain initial six or 12 month psychological and pediatric examinations on a number of children who had been in the day care program for some time but entered the study too late, we were able to obtain 18-month developmental measures on most of the children in the 36-month group and family longitudinal samples.

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[1] The 36-month group and family longitudinal samples consisted of children in all three 18-month samples who remained in the study until they were three years of age.

While the 18 and 36 month cross-sectional samples made it possible to determine the effects of early versus later entry into a day care program on children's development, we also wanted a more fine-grained analysis of the relationship between the age at which children entered the program and their development at 18 and 36 months of age. Therefore, in the 18-month longitudinal analyses we also computed correlations between age of entry into day care (ranging from two to 14 months of age) and the 18-month developmental outcome measures. In the 36-month longitudinal analyses we computed correlations between age of entry into day care (ranging from two to 21 months of age) and the 36-month developmental outcome measures.

The impact of the infant day care service on the family was evaluated at two key points in time: (1) the *immediate effects* on the family were assessed soon after the child entered the program; and (2) the *long-term effects* on the family were assessed when the child was three years of age, after the families had been in the program for relatively longer periods of time.

The principal method for studying the infant day care programs was the use of direct, systematic, all-day naturalistic observations of each child in the study in his or her usual day care setting. Members of our research team spent an entire day, from approximately 9:30 a.m. to 4:30 p.m., observing each sample child in his or her group day care classroom or family day care home at 12, 18 and 24 months of age.

In studying the infant day care programs, our strategy was to focus on the psychological experiences of each individual sample child, rather than studying children in a particular day care setting as a group, or the behavior of caregivers in general. Focusing on an individual (pre-selected) sample child the Observer recorded (on a set of pre-coded protocols) various aspects of the child's psychological experiences throughout the observation day. Bilingual observers were used for Hispanic children or for English-speaking children with Hispanic caregivers.

In assessing children's psychological experiences in infant day care, we distinguished among the following three major program components: (A) the *Child's Physical Environment*, which included the play materials, equipment, and space available to the child; as well as how free or restricted the child was to explore the environment; (B) the *Caregiver(s)' Behavior with the Child*, which included the amount of individual attention the child received, as well as the specific cognitive, language, social, and emotional stimulation provided to the child; and (C) the Child's Behavior, which included the child's cognitive, language, social, and emotional functioning.

During the naturalistic observations, the Observers also collected data related to the nutrition and physical safety aspects of the day care program. Using the Food Record, (which was developed by Catherine Cowell, Director of the New York City Health Department's Bureau of Nutrition) the Observers coded the types of food presented and eaten by the sample child during the noon meal and snacks. The Observers also recorded the physical safety hazards and safety practices by caregivers in the day care setting.

The quality of health care provided to children in their day care programs was evaluated on the basis of the day care agency's health records on children. Copies of each sample child's health records were obtained every six months. On the basis of the records, the following three indices of the quality of health care were used: (1) Immunization Status: Had the child received all of the immunizations considered necessary and appropriate for children of this age? (2) Knowledge of Medical Problems: Did the records indicate that the agency knew about medical problems that the study pediatricians had found? (3) Follow-Up: Medical problems which the study pediatricians found were immediately reported to the Director of the day care program by the study Medical Director, with recommendations for further diagnosis and treatment. Did the agency's health records contain the information provided by the Medical Director, and had there been appropriate follow-up of the problems?

The program data obtained from the naturalistic observations of each sample child at 12, 18, and 24 months of age were statistically analyzed cross-sectionally and longitudinally.

The group and family infant day care programs were cross-sectionally compared at 12, 18, and 24 months of age to see whether the programs differed for children at these ages. The cross-sectional analyses were concerned with whether the group and family infant day care programs differed. The longitudinal analyses were designed to study the relationships between children's infant day care experiences at 12, 18, and 24 months of age and relevant aspects of their development at 36 months of age. The longitudinal analyses were concerned with whether differences between the two types of programs or individual differences in children's infant day care experiences were related to their subsequent development.

While for discussion purposes we will speak of differences between the group and family infant day care programs or their effects on children and families, the basic approach we have used in analyzing most of the data in the study was multiple-regression/correlation (MRC) analysis.

MRC was the most appropriate data analytic procedure to use for a complex study of this kind, where it was necessary to simultaneously deal with a relatively large number of variables. It allowed us to study the relationships between one dependent variable and several independent variables, while controlling for the effects of a set of control variables in a single analysis. There are a few other advantage to MRC. It provides estimates of the unique variance accounted for in the dependent variable by various independent variables in the analysis. It is also possible to study the relationships between continuous variables, such as IQ scores, with categorical variables, such as sex. Within the regression model, whenever a categorized variable was used either as a control or independent variable, we have dummy coded the categories and used the series of dummy coded variables as representing the variable in question. For a more complete description of multiple-regression/correlation (MRC) procedures, including dummy coding, the reader is referred to Cohen and Cohen (1975).

The first step in the data analytic process in the present study was to find out whether the three 18-month samples or three 36-month samples to be compared differed significantly in any important respects before they entered the day care program. Since children were not assigned to the three samples randomly nor was it feasible to match them, it was necessary to statistically control for any initial differences among them, which might confound the results.

We compared the three 18-month samples and three 36-month samples on 17 initial characteristics, which are listed in Table 2-2. These potential control variables fell into two categories: (1) Demographic characteristics, such as the child's sex, ethnicity, birth history, etc., which cannot change with experience, but may affect children's development; and (2) Baseline measures, such as children's initial height, IQ, the family's initial socio-economic status, income, etc., which are similar or identical to our 18 or 36 month developmental outcome measures, and can change as a function of the day care program or other environmental factors.

Using the list of 17 potential control variables, we carried out separate regression analyses utilizing membership in each of the three comparison samples (longitudinal group day care, longitudinal family day care, cross-sectional children) as independent variables and each of the potential control variables as dependent measures. This procedure served to determine if the three samples were equal on the potential control variable. In any instance where we found a significant difference among the three samples, that potential control variable was selected as a regular control variable in all future analyses where the three samples were compared. The function of a control variable in the multiple-regression model is the same as that of a covariate in the analysis of covariance design. The three 18-month samples differed on three initial characteristics and the three 36-month samples differed on six characteristics. These are discussed in greater detail in Chaper 5 of this report.

Having identified the control variables to be used in all subsequent analyses of the data, we studied the relationships between various independent and dependent variables, employing multiple-regression correlation (MRC) procedures. Within each regression equation, we first entered all appropriate control variables and then the independent variables being studied in that analysis. In this way we studied the relationships between our independent and dependent variables, with the potentially biasing effects of the control variables removed or partialled out. Within the regression model, this means that we were determining the significance of the partial correlations between our dependent and independent variables. The correlations that will be reported later are partial correlations, and the means are adjusted means, i.e. means corrected for the effects of the control variables on the dependent measures.

The two most important independent variables in this study were: (1) Type of Infant Day Care Program (Group Day Care, Family Day Care, or No Infant Day Care Program); and (2) Age of Entry into Infant Day Care (ranging from two to 21 months of age). Since type of day care program was the most important independent variable in the study, we always entered age of entry into our regression equations first, in order to eliminate or partial out differences between programs in age of entry on the dependent variable being studied.

The principal dependent variables in the study were the 18 and 36 month developmental outcome measures and the 12, 18, and 24 month program variables described earlier. In some analyses, the program variables were used as dependent variables, e.g. when we were interested in seeing whether the group and family day care programs differed. In other analyses, the program variables served as independent variables, e.g. when studying the relationships between children's individual infant day care experiences and various aspects of their subsequent development. While in most analyses initial characteristics served as control variables, in some analyses they were used as independent variables, e.g. in studying the effects of birth complications on children's development.

Another important aspect of our data analytic procedure should be mentioned. If we were unable to obtain data on particular children or families from which our control or independent variables were derived, we inserted sample means of that variable into the regression equation. It has been demonstrated that this procedure does not bias the results of the analysis and yields maximum statistical power. (Cohen & Cohen, 1975, Chapter 7). However, if the data for a dependent variable were missing, we dropped the sample child from that analysis. For example, if we were missing an initial Bayley Mental score (obtained at six or 12 months of age) on a child, we used the total mean Bayley score in the equation for that child. If we were missing an 18-month Bayley score, when we were comparing the 18 month Bayley scores of the group and family day care children, we dropped the child from that analysis. However, if the child's height at 18 months was available, when we compared the two samples in terms of height at 18 months, we included the child in that analysis. Therefore, the sample sizes may vary somewhat for analyses involving different dependent variables.

Finally, in analyzing the data, we used conservative criteria for setting significance levels. When testing for initial treatment group differences, we used the $p \leq .05$ significance level. By doing so, we were more likely to control for all possible initial treatment group differences, even though some of the differences may be spurious. This procedure in no way invalidates the results of our subsequent data analyses. When comparing the two types of infant day care programs, or when studying the effects of these programs on children and families, we used the $p \leq .01$ significance level rather than the more usual $p \leq .05$ level. We used this more stringient significance level in evaluating program differences or program effects, because of the sheer number of statistical tests performed on these data. By doing so, we reduced the number of spurious significant findings.

Table 2-1

SUMMARY OF STUDY PROCEDURES

PROCEDURES	WHEN PROCEDURE PERFORMED (Child's age in Months)
A. CHILD'S PSYCHOLOGICAL DEVELOPMENT	
Assessment of Infant Day Care Programs:	
1. All-day Naturalistic Observations	12, 18 and 24 months
Assessment of Children:	
1. Bayley Mental Scale	6, 12 and 18 months
2. Stanford-Binet Intelligence Scale	36 months
3. Peabody Picture Vocabulary Test	36 months
4. Play Interview	36 months
5. Naturalistic Observations	36 months
B. CHILD'S NUTRITION, PLYSICAL HEALTH, AND GROWTH	
Assessment of Infant Day Care Programs:	
1. Food Record	12, 18, and 24 months
2. Safety Checklist	12, 18, and 24 months
3. Day Care Agency Health Records	6, 12, 18, and 36 months
Assessment of Children:	
1. Birth Records	When child enters program
2. Pediatric Examination	6, 12, 18 and 36 months
3. Laboratory Tests	6, 12, 18 and 36 months
4. Visual, Hearing, and Dental Screening	36 months
C. FAMILY DEVELOPMENT	
Assessment of Infant Day Care Programs: (None)	
Assessment of Families:	
1. Family Interview	When child enters program and 36 months

Table 2-2

DEMOGRAPHIC AND INITIAL CHARACTERISTICS OF CHILDREN AND FAMILIES

I. CHILDREN

Sex

1. Male/Female

Ethnicity

2. Black English Speaking/Hispanic

Birth History

3. Normal/Abnormal (Low Birth Weight and/or Complications)

Growth

4. Height
5. Weight

Nutritional Status

6. Normal/Borderline/Low (Hemoglobin-Hematocrit)

Medical Abnormalities

7. No Abormalities/One or More Abnormalities
8. Minor Abnormalities/Significant Abnormalities

Psychological Development

9. Bayley Mental Score

II. FAMILIES

Socio-Economic Status and Economic Resources

10. Hollingshead Two-Factor Index of Social Position Score
11. Family's Total Annual Rate of Income
12. Sources of Income: Wages Only/Wages and Public Assistance/ Public Assistance Only

Family Composition

13. Two-Parent Family/Single Parent Family
14. Single Parent Alone/Single Parent Extended Family
15. Number of Children in Family
16. Mother's Age When Sample Child Was Born

Family Functioning

17. Total St. Paul Profile of Family Functioning Score

CHAPTER 3 - DAY CARE PROGRAMS IN STUDY

The sample consisted of group and family infant day care programs, as well as children and their families. The day care programs will be described in this chapter. The children and families will be described in a later chapter.

Thirty-one publicly and privately funded non-profit, licensed group and family infant day care programs were studied. In addition to these programs, we recruited 36-month cross-sectional children from 21 publicly funded licensed preschool day care programs, which were not studied. A total of 52 day care programs participated in the study.

The publicly funded day care programs[1]. in the study were financed and operated under guidelines established by the New York City Agency for Child Development (ACD), but they were sponsored and operated by private non-profit organizations under a contract with ACD. Sponsors included private social service agencies, religious and philanthropic organizations, labor unions, hospitals, universities, and more recently politically active community groups.

The private non-profit day care programs[2]. in the study were largely privately financed and operated, usually under very similar auspices as those which sponsored the publicly funded day care programs. While most of the money to support these day care programs came from private sources, the sponsoring organizations were reimbursed on a purchase-of-service basis for children from low-income families in their programs who were eligible for public day care. In order to make sure that the children and families from these day care programs were economically comparable to those from the public programs, we recruited only purchase-of-service children into the study.

Priority in public day care programs in New York City is given to children from low-income working families or welfare families, where the parents are seeking employment or are enrolled in job-training programs. In 1975 approximately four-fifths of the families in these programs had total gross annual incomes of $8,000 or less. Thirty-seven percent of the families were on public assistance. While families were expected to pay for the day care service on a sliding scale, depending upon the family's income, most families paid $2.00 a week or less.

The two major alternative methods of providing substitute day care for infants in New York City are group and family day care. Briefly, in group day care children are cared for in a day care center, with

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[1]. We will refer to these as public day care programs, because they are largely publicly-financed, although they are privately sponsored and operated.

[2]. We will refer to these as private day care programs, because they are largely privately-financed, although they receive some public funds for children who are eligible for public day care.

8-10 children of approximately the same age in a room, and several caregivers or teachers. In family day care children are cared for in a licensed private home or apartment by one caregiver, who is referred to as the provider-mother. The child's parent, on the other hand, is referred to as the user-mother. A maximum of six children, with no more than two children under two years of age, may be cared for in a licensed family day care home, including the provider-mother's own children. We will now describe these two types of infant day care programs in greater detail.

Group Infant Day Care Programs in Study

Before describing the group infant day care programs in the study, we will briefly review the history of these programs in New York City. The first creche or day nursery in New York City for young children, including infants and toddlers, opened in 1852. It was called the Nursery for the Children of Poor Women, and was privately funded and operated under the auspices of the Nursery and Child's Hospital in Manhattan. By 1921 there were 110 known day care centers in New York City, out of a total of about 600 centers in the United States.

During World War II, due to the large numbers of mothers with young children who went to work to support the war effort, two major changes occurred in the day care field in New York City.

(1) Public funds for private non-profit day care centers here became available for the first time. In 1943 the New York State legislature appropriated money for day care centers for communities, such as New York City, who were not eligible for federal day care funds through the Lanham Act. Under a tri-partite arrangement, the State paid one-third the cost, the City paid a third, and the final third was expected to come from parent fees and private contributions raised by each center's private sponsoring organization. From this time, most of the money for public day care programs in New York City came from public funds, but these programs continued to be privately sponsored by non-profit organizations, who maintained a certain degree of autonomy in operating the programs. Subsequently, public funding of day care programs in New York City has undergone several changes, which will not be reviewed in detail here.

The next important change in public funding for day care occurred in 1967, when Congress amended the Social Security Act making virtually open-ended Federal day care funds available to States and Cities under Title IVA on a matching basis. The Federal government provided 75 percent of the cost, and New York City and State contributed 12½ percent each to support the public day care programs. The availability of open-ended federal day care funds resulted in a rapid expansion of public day care facilities in New York City. In 1970 about 8,000 children were enrolled in 120 public group day care centers. By 1974, there were 426 public group day care centers, with a budgeted capacity for about 25,000 preschool and 8,000 school age children and 275 infants. (Keyserling, 1974).

During this period there was also an increase in public family day care programs in New York City. In 1970 there were 4,579 children from two months to 12 years of age in 1,268 licensed family day care homes. By 1974, there were 54 family day care centers, with 1,609 satellite family day care homes affiliated with these centers, providing care for 6,342 children.

(2) The second major change which occurred in the day care field in New York City during World War II was the enactment of a new comprehensive Health Code in 1943 to regulate and license day care facilities in the city. Prior to this time, permits for the operation of day care centers were governed by the New York City Sanitary Code, which was primarily concerned with children's physical health and safety. During the War, because of the great need for day care services for working mothers with young children, hundreds of day care centers were opened throughout the city to meet this need by fly-by-night operators who were primarily interested in making a profit. Large groups of young children were provided with custodial care under crowded conditions by too few, inexperienced, and underpaid personnel.

The 1943 Health Code, which was a response to this situation, established a historic precedent: For the first time, in order to be licensed, day care centers in New York City had to provide for children's psychological as well as their physical needs. The Health Code established standards for the amount of play space and materials that must be available for each child, caregiver-child ratios, as well as educational and training requirements for caregivers.

Another historic step was the establishment of a Day Care Unit within the New York City Health Department to make sure that the new Health Code was enforced, with the legal authority to license centers or revoke the licenses of centers which failed to meet Health Code regulations, as well as the power to close unlicensed centers. The Day Care Unit's small staff was supplemented by pediatricians, nutritionists, and early childhood educators as consultants.

The 1943 Health Code spelled out in great detail the conditions under which children under two years of age could be cared for in day care centers, but group care for infants and toddlers was not prohibited. In 1959, however, the New York City Health Code was revised, which for the first time in the city's history prohibited group care for children under two years of age, on the assumption that such group experience for prolonged periods of time during the day was undersirable for babies.

Family day care was included for the first time in the 1959 revision of the Health Code. The Code specified that no more than two children under two years of age could be cared for in a family day care home, including the provider-mother's own children.

In 1968 the New York City Health Code was revised again to permit group care for infants as young as two months of age in licensed day care centers in the city with strict standards regulating the conditions under which such care for babies could be provided.

In June 1969 the Riverside Infant Day Care Center, sponsored by the Riverside Church opened in Manhattan, with Nina Mann as its Director. After a great deal of consultation with the Health Department's Day Care Unit. Riverside was the first public group infant day care program in New York City to be licensed under the new 1968 Health Code. The Riverside Infant Day Care Center was designed to provide care for 27 infants from two to 34 months of age of single adolescent mothers to enable the young women to complete their schooling. Riverside was also the first infant day care program in the study.

During the planning phase of the study (1970 1971). there were approximately 47 additional group infant day care programs in various planning stages, which were expected to accommodate about 1,200 babies. On the basis of such plans we did not anticipate any problem in recruiting an adequate number of group infant day care programs or sample children from these programs within the time frame of the study. However things turned out quite differently than expected. When we began to recruit children into the study in September 1972. only seven group infant programs were operating. Four of these programs were in the study. but the number of children of the ages we needed was relatively small.

Subsequently only nine additional licensed group infant day care programs were opened in New York City. considerably less than the expected number. We succeeded in recruiting seven of the nine new programs into the study. However, a few of the programs opened too late to recruit young infants into the study with adequate time to follow them longitudinally to three years of age. A few programs that were in the study earlier provided fewer sample children than we expected. And several programs that had agreed to participate in the study never opened. For these reasons, it became necessary for us to extend the recruitment of the longitudinal sample by six months (until September 1975). in order to obtain an adequate number of longitudinal group infant day care children. This in turn made it necessary to extend data collection. and the life of the study, by six months.

Since 1968, when the New York City Health Code was changed, a total of only 16 public group infant day care programs opened in New York City and 11 of these were in the study. The 16 programs combined served fewer than 400 children from two months to three years of age at any one time. This contrasted sharply with the more than 300 additional day care centers. serving an additional 25,000 preschool and school age children, which opened between 1970 and 1974 in New York City. While there was a great increase in the number of group day care centers in New York City relatively few of them had infant programs, and less than three percent of the children in these centers were under three years of age.

We also encountered serious and near fatal problems with the group infant day care programs in completing the study. In the late Spring of 1976, due to the fiscal crisis in New York City, the closing of all of the public group infant day care programs in the city was seriously being considered. Since we had only completed the 36-month final assessment on less than half of our longitudinal group infant day care sample, the closing of the group infant programs would have killed the study, after so many years of effort and such a large expenditure of money. Fortunately not all of the group infant day care programs in the city were eliminated. Instead, in July 1976, eight of the 16 licensed group infant programs were defunded, including four of the infant programs in the study.

The closing of these four programs presented some problems, but we were able to overcome them with the invaluable assistance of the Directors and Family Counselors in these programs, some of whom were about to lose their jobs. They were willing to help the study at such a time because of the positive relationship we had developed with them over a period of years and because they believed in the value of the research. Children who were at least 33 months of age were seen earlier than 36 months. Arrangements were made to complete the 36-month assessments of children transferred to other programs in their new day care environment. Children who were not transferred to a different program were seen at home.

While we were able to complete the study during a period of turmoil and uncertainty, the group infant day care programs in New York City were in serious trouble. In the fall of 1977, the future of the remaining eight group infant day care programs in the city remains uncertain.

Now that we have recounted the brief and tumultuous history of the group infant day care programs in New York City, we will provide a general description of how these programs operated.

First it should be mentioned that all of the infant programs were established in new group day care centers, most of which also had preschool programs. That is, none of the day care centers which had been operating prior to 1968, when the Health Code was revised, started infant day care programs in their centers. The primary reason for this was that the established centers simply did not have the space needed for such programs. In order to start an infant program in these centers, major and costly renovations would have been necessary, as well as the elimination of classrooms for preschool children. Therefore, it was easier to start infant programs in new centers.

Several consequences flowed from the fact that the infant programs were established in new day care centers. In addition to the fact that little was known about how to structure group programs for infants, during the entire period the programs were being studied they were still in the process of working out their organizational problems. The Board of Directors of the new programs also differed greatly from the Boards of the

Older day care programs in ways which profoundly affected both the operation of the programs and the study. These differences will be discussed in the next chapter, when we describe the methods and problems in recruiting programs and children and families into the study.

Most of the infant programs were established in centers which also included preschool programs; although a few, such as the Riverside Infant Day Care Center, were free-standing. While the infant and preschool programs operated in the same center under the overall supervision of the Director, the infant programs were relatively autonomous units. They had a separate Infant Director (who was designated as Assistant Director and reported to the Director), a separate budget, and when ever possible separate self contained space within the center.

The infant programs were relatively small in comparison to the preschool programs in the same center. Whereas a preschool program with 50 children was considered small, the number of children in the infant programs ranged from 10 to 55, with most of them providing care for about 30 babies.

The public group day care centers in New York City, including the infant programs, operated 10-12 hours a day, five days a week, 12 months a year. They were closed only on legal holidays.

Children in the infant programs were usually grouped homogeneously in age, with 8-10 children in each self-contained classroom. Children were generally placed in the following age groups, although the ages varied someewhat from one program to another; (1) 2-6 months: (2) 7-15 months; (3) 16-24 months; and (4) 2-3 years of age. Smaller programs had fewer groups, with children who varied more greatly in age within a group.

The 1968 New York City Health Code required that during the first six months of life, the caregiver/child ratio cannot exceed 4 to 1; and from six to 36 months of age it cannot exceed 5 to 1. Since the programs operated 10-12 hours a day, in order to maintain these caregiver/child ratios, the programs employed both full and part-time caregivers, and work hours were staggered to insure adequate coverage throughout the day.

In ACD funded programs, for children from two to 24months of age, each group had a Head Teacher and several Assistant Teachers or Aides. Head Teachers must be High School graduates and have had some experience with childred of this age. The Assistant Teachers must have achieved at least 8th grade reading ability. For the two to three year group, the Head Teacher must have obtained at least a B. A. Degree and a New York State certificate in Early Childhood Educations. The Directors must have at least a B.A.degree New York State certification in Early Childhood Education, and several years of teaching experience.

Most Directors had Masters degrees in Early Childhood Education. In addition to the foregoing professional and paraprofessional personnel, each program had a Family Counselor, who was responsible for doing intake interviews and working with the families. The Family Counselors usually were responsible for recruiting children and families into the study.

Nine of the 11 group infant day camp programs in the study were funded and operated under the auspices of the New York City Agency for Child Development. Two of the group programs differed in the following respects. The Hunts Point Parent Child Center was totally federally-funded by the Office of child development (OCD), although the money was channeled through ACD, which also guided the operation of this center. The Seton Hall Day Care Center, which was sponsored by the New York Foundling Hospital, was the only private licensed group infant day care program in the city. Seton Hall received money from ACD on a purchase-of-service basis for children in their center who were eligible for public day care.

Family Infant Day Care Programs in Study

While family day care was the preferred method of providing substitute day care for babies, until 1967 there were relatively very few infants in licensed publicly-supported family day care facilities in New York City.

Prior to 1967, Family Day care was a centrally-operated program, which was funded and operated directly by the New York City Bureau of Child Welfare (BCW), through a single regional office in each borough. In contrast to group day care, which was regulated by the New York City Health Code and licensed by the New York City Health Department's Day Care Division, family day care homes here were licensed by the Bureau of Child Welfare, under regulations established by the New York State Department of Social Services. Because of the limited number of personnel in the BCW family day care program, once a family day care home was licensed there was generally very little on-site supervision of these family day care homes, and very few supportive services for user or provider mothers.

Beginning in 1967, Family day care in New York City underwent a process of decentralization, changing from public to private sponsorship, very similar to the way in which group day care programs operated. While there was also an increase in family day care facilities in New York City, the total number of children in family day care here was considerably less than the number of children in group day care. Whereas there were about 33,000 children from two months to 12 years of age in public group day care programs in New York City in 1974, there were only about 6,000 children in public family day care programs. The age distribution of the children in the group and family day care programs also differed greatly. While less than three percent (275) of the children in group day care were under three years of age, approximately 50 percent (3,000) of the children in family day care were under three years, and about half of these children were less than 18 months. Both in terms of absolute numbers and percentages, these figures indicate that the Family Day Care programs in New York City were more geared to serve children under three years of age than the group programs. These figures also explain why it was easier for us to recruit infants from family day care than group day care.

There were three types of family day care programs in the study: (1) the Career Family Day Care programs, which served about 3,500 children; (2) the Cluster Family Day Care programs, which served about 2,450 children; and (3) the Voluntary Family Day Care programs, which served about 1,500 children on a purchase-of-service basis.[3] We obtained approximately 50 percent of our family day care sample from the Career programs, and about 25 percent from each of the other two types of Family Day Care programs.

Career Family Day Care

The Career Family Day Care program originated as a federally-funded poverty program by the Office of Economic Opportunity (OEO) in 1967. While the development of children in the family day care homes was considered important, the primary purpose of the program was to make it possible for single-parent welfare families to become self-supporting.

The user-mothers, whose children were placed into day care, and the provider mothers, who cared for the children in their own homes, had to come from welfare or low-income families to qualify for the program. Seventy-five percent of the user and provider-mothers had to be on welfare when they first applied for the program.

The families eligible for the Career program were to be helped to become self-supporting in the following ways. The user-mothers were given employment counseling and assistance in taking advantage of job training programs in the city. They were also provided with free family day care for their children, while they were working or getting trained. The provider-mothers were given an opportunity to earn money by caring for children in their homes. The child care fees they earned would reduce the amount of public assistance they received, until they became totally self-supporting.

The Career Family Day Care program was organized similar to the group programs in New York City. Unlike the older Bureau of Child Welfare Family Day Care program described earlier, the Career program was decentralized and privately-sponsored from the beginning. Twenty-one privately-sponsored, federally-funded Career Family Day Care Centers were established in 1967-68 in poverty areas of the five boroughs of the city. Each center supervised about 50 licensed satellite family day care homes, which could serve approximately 200 children from two months to 12 years of age.

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[3] These figures were obtained from ACD Day Care Directory prepared in August 1967.

Each center consisted of a central staff, under the supervision of a Director, who had overall responsibility for the operation of the center and the family day care homes affiliated with the center. The Director, in turn, was responsbile to an elected Board of Directors, which included representatives of the private sponsoring organizations, parents with children in the program, and community people. In contrast to the group day care center Directors, the Directors of the Career programs were not required to be professional early childhood educators. People from the community who had demonstrated leadership and concern for poor families were eligible to be Career Family Day Care Directors. The educational input into these programs was provided by other professional and paraprofessional people.

In addition to the Director, each center included the following key staff members; (1) the Day Care Counselor, who functioned as an Assistant Director, and worked with the user and provider-mothers in placing children into family day care homes, the Counselor also dealt with family problems; (2) Vocational Counselors, who worked with the user-mothers to help them to obtain job-training and employment; (3) part-time licensed Nursery School Teachers, with at least a B. A. degree and certification in Early Childhood Education; the Teachers, who were provided by the New York City Board of Education, offered weekly in-service training for provider-mothers at the center; they also trained the Education Aides; (4) each center had about 10 Education Aides; these were paraprofessional people, who visited each family day care home twice a week to work with the provider-mothers in facilitating children's development.

Provider-mothers had to be licensed, under regulations established by the New York State Department of Social Services, before children were placed in their homes. While a provider-mother was permitted to care for a maximum of six children, if there were two children under two years of age, in her home she was only allowed to care for a total of five children. In 1976, however, an average of only three children were placed in ACD funded family day care homes.[4]

In 1972 when direct federal poverty funds for the Career program ended, it was transferred to the New York City Agency for Child Development, which was established in 1971 as a super-agency to deal with all child welfare programs in the city, with Georgia MacMurray as its first Commissioner. Under ACD auspices the Career program was funded and operated as a day care program rather than a poverty program, on the same basis as the group day care programs in the city. When the Career program was transferred to ACD, the requirement that 75 percent of the user and provider-mothers had to be on welfare when they applied for the program was discontinued, although priority was still given to low-income families.

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[4] Private communication from Mary Jackson, ACD Family Day Care Program Director.

Nine of the 21 Career Family Day Care programs in New York City participated in the study. These nine programs were selected because they had the greatest number of infants in their family day care homes.

Cluster Family Day Care Programs

In 1972 the centrally-operated Bureau of Child Welfare (BCW) Family Day Care program was transferred to the newly established Agency for Child Development (ACD), which decentralized these programs and placed them under private sponsorship.

Fifteen to twenty family day care homes in a community were linked with an established privately sponsored, public day care center in their area. The family day care homes formed a "cluster" around the day care center with which they were affiliated, hence the name "Cluster" Family Day Care programs. The provider-mothers were supervised by a Family Day Care Coordinator attached to the center, who in turn reported to the Center Director. The supporting educational and social services offered to provider and user mothers in the Cluster programs were similar to those in the Career programs.

The income eligibility requirements for user-mothers in the Cluster programs were also identical to those in the Career (or group) programs, but the income eligibility requirements for the provider-mothers in the Cluster and Career programs differed greatly. Whereas the provider - mothers in the Career program had to come from welfare or low-income families, provider-mothers in the old BCW Family Day Care Program and subsequently in the new Cluster Family Day Care programs had to come from self-supporting families, where another person, usually the husband, was the principal bread-winner. The rationale for this requirement was that the provider-mothers should not have to depend on child care fees as the family's major source of income, since there was no guarantee that her home would always be filled with children. In December 1976, whereas 75 percent of the provider-mothers in the Career program were receiving supplemental public assistance, only three percent of the provider-mothers in the Cluster programs were receiving welfare supplements; 49 percent of the provider-mothers in the Cluster programs were from low-income families, and 48 percent were from middle-income families.[5]

Thirty-five Cluster Family Day Care programs were established in existing group day care centers, which did not have infant programs. The family day care component made it possible for these centers to extend their child care service downward to children from two to 36 months of age.

Five of the 35 Cluster programs in New York City participated in the study.

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[5] Personal Communication from Mary Jackson.

Voluntary Family Day Care Programs

In addition to the two types of public family day care programs described earlier, there were 11 voluntary non-profit licensed family day care programs in New York City who received some public funds. The programs were largely privately financed and operated by private social service agencies and philanthropic and religious organizations. These family day care programs developed as an outgrowth of the foster home services program and were designed to reunite children with their natural parents. Many of the children came from low-income families who were eligible for public day care. The voluntary family day care programs were reimbursed by the New York City Agency for Child Development for the cost of child care for these children on a purchase-of-service basis.

Five of the 11 Voluntary family day care programs participated in the study.

Preschool Day Care Programs

In addition to the 31 infant day care programs studied, we recruited most of our 36-month cross-sectional children from 21 public preschool day care programs, which we did not study.

When we started to recruit 36-month cross-sectional children, we discovered that the day care programs in the study could not provide an adequate number of three year old children who met our criteria: Children who were reared at home by their own families during the first 2½ -3 years of life and first entered a day care program at this age. We learned that most children who enter public day care programs in New York City at three years of age have had private day care experience outside of their own homes during the first few years of life, while their mothers were working or going to school.

By the Fall of 1975, we succeeded in recruiting only 26 cross-sectional three year old children who met our criteria into the study. Most children entered a day care program in the Summer or Fall. In the Spring of 1976 (with only a few months to recruit an additional 50-75 children for the 36-month cross-sectional sample), we decided to approach as many new preschool day care programs as possible to obtain the number of children we needed.

Twenty-one preschool day care programs were recruited into the study from April to September 1976, from which we obtained 53 additional 36-month cross-sectional children. All but one of these were group day care programs. Apart from the fact that many more three year olds enter group than family day care, in April 1976 a freeze on all new intakes into public family day care programs in the city was imposed by the Agency for Child Development, which lasted for more than a year. For these reasons, most of the children in the 36-month cross-sectional sample were recruited from group day care programs.

Eleven group infant day care programs, 20 family infant day care programs, and 21 preschool day care programs participated in the study. They are listed in Tables 3-1 and 3-2.

Table 3-1

Infant Day Care Programs Participating in Study

Group Day Care Centers

Name	Location
Community Sponsors Day Care Center	Brooklyn
Friends of Crown Heights Day Care Center	Brooklyn
Jamaica NAACP Montauk Day Care Center	Queens
M.F.Y., Group Child Care Center, Inc.	Manhattan
Pacific Community Child Development Center	Brooklyn
Parent-Child Center of Hunts Point	Bronx
Richmond Early Learning Center	Staten Island
Riverside Church Infant Day Care Center	Manhattan
Seton Day Care Center-New York Foundling Hospital	Manhattan
Tabernacle Day Care Center	Brooklyn
United Organization of Suffolk Street	Manhattan

Family Day Care Programs

Career Programs

Community Development, Inc.	Manhattan
Church on the Hill Day Care Program	Manhattan
Clinton Day Care Center	Manhattan
Community Life Family Day Care Program	Manhattan
Hunts Point Multi-Point Service Family Day Care	Bronx
Park Slope Family Day Care	Brooklyn
University Settlement Family Day Care	Manhattan
Willoughby Careers Day Care Center	Brooklyn
Youth Village, Inc.	Bronx

Cluster Programs

Bedford Avenue Family Day Care Center	Brooklyn
Hudson Guild Family Day Care Center	Manhattan
Morrisania Family Day Care Center	Bronx
Wake Eden Family Day Care Center	Bronx
Westchester-Tremont Family Day Care Center, Inc.	Bronx

Private Programs

Cardinal McCloskey School Family Day Care Program	Bronx
Children's Health Service	Manhattan
Jewish Child Care Association of New York	Manhattan
New York Foundling Hospital Day Care Program	Manhattan
Talbot Perkins Children's Service	Manhattan
Windham Child Care Agency	Manhattan

Table 3-2

Pre-School Day Care Programs Participating in Study

Name	Location
Bedford Avenue Day Care Center	Brooklyn
Coalition for Human Housing	Manhattan
Concourse Day Care Center	Bronx
East Tremont Child Care Center	Bronx
Forest Avenue Day Care Center	Bronx
Graham Child Care Center	Brooklyn
Grand Street Settlement	Manhattan
Grant Day Care Center	Manhattan
Hallet Cove Child Development Center	Queens
Highbridge Nursery School	Bronx
Joseph Di Marco Day Care Center	Queens
Louis Pink Child Care Center	Brooklyn
Malcolm X Day Care Center	Queens
Nat Azarrow Day Care Center	Brooklyn
Riverside Church Day Care Center	Manhattan
Seven Corners Child Care Center	Bronx
Soundview Day Care Center	Bronx
Victory Day Care Center	Bronx
West Side Day Nursery	Bronx
Westchester-Tremont Day Care Center	Bronx
Woodside Day Care Center	Queens

CHAPTER 4 - METHODS AND PROBLEMS IN RECRUITING DAY CARE PROGRAMS AND CHILDREN AND FAMILIES INTO THE STUDY

The public and private day care programs participated in the study on a voluntary basis. The voluntary participation of private day care programs in a study of this kind is self-evident. The voluntary participation of publicly-funded day care programs, which constitute most of the programs in the study, may require some explanation.

Public group and family day care programs in New York City may be organized differently than such programs in other communities. While these programs are publicly-funded, they are privately sponsored, and therefore they enjoy a certain degree of autonomy. Although the study was co-sponsored by the New York City Agency for Child Development (ACD), which funds both the group and family day care programs here, and the New York City Health Department, which licenses the group day care centers, these day care programs were free to participate in the study or not. We made it clear to the Directors and Boards of the infant day care programs that, while the study was being carried out in cooperation with ACD and the Health Department, it was an independent study.

Before the children and families could be approached, it was necessary to recruit the day care programs into the study. This was more difficult than it might have been several years ago. The infant day care programs in New York City were all new programs, with new Boards, and new Directors. The Boards of the older day care programs here tended to be dominated by affluent white people who did not live in the community. Their attitudes toward research in the day care centers which they sponsored were more positive. The Directors of the older day care programs, many of whom had been with the program for many years, were generally freer to make decisions, such as whether to participate in research, with relatively little consultation with their Boards.

On the other hand, the new day care programs that were started during the late 1960's and early 1970's, which included all of the infant programs in New York City, operated quite differently. The Boards of the new programs were largely made up of minority and community people and parents, who tended to be more politically-oriented than the older Boards. The Directors, who were also new, were not as free to make decisions without approval from their Boards. This meant that to recruit the infant programs into the study it was essential to obtain the Board's consent, which was more difficult because more people were involved in the decision-making process. The members of the new Boards also tended to have strong negative attitudes toward research, which were often expressed in the following bitter terms: "We're tired of being studied! "

Although the older day care programs were privately-sponsored, they were not necessarily community-controlled. The new day care programs tended to be more community-controlled, because of the make-up and political-orientation of their Boards. Community-Control was more democratic, which made the task of recruiting infant day care programs into the study more difficult.

From the outset, we decided that the only way the study could be carried out was to make the study itself community-controlled. This was achieved through the Study Policy Committee, which was described earlier. Through the Policy Committee, which was formed during the planning phase of the study, all participants in the study would have an opportunity to contribute their ideas to the study, from its design to the preparation of the final report. We believe that by offering Directors and Boards the opportunity to participate fully in all aspects of the study made it possible to recruit as many day care programs as we did into the study, at a time when research had become a dirty word for many of these people.

The first step in recruiting a day care program into the study usually involved a meeting with the Director to discuss the research. The initial meeting was usually arranged by someone from ACD or the Health Department who was familiar with the Director. This person often accompanied us to the first meeting.

While it was essential to obtain the Director's acceptance of the study, in most cases it was only a first step. It was equally important to gain the acceptance of the Board, as well as key personnel in the day care program, such as the Family Counselors, who were responsible for recruiting children into the study. After meeting with the Director, the next step usually involved discussing the study with the Board or key members of the Board, such as the Chairperson, which was arranged by the Director.

The relationships between Directors and their Boards differed greatly from one day care program to another. In some cases the Board would follow the Director's recommendations, so that it was not always necessary for us to meet with the Board. In other cases, the Director deferred to the Board or one or two key members of the Board who played a decisive role.

If it was necessary for us to meet with the Board, which was usually the case, meetings were generally arranged in the evenings, since most Board members worked during the day. We found that when meeting with the Board, particularly if there were many people involved, it was desirable to have more than one senior member of the research staff present to field questions, which were often provocative and challenging.

We encouraged people to express their negative attitudes and objections to the study openly, so that they could be dealt with. We found that day care programs which gave us the most difficulty initially were sometimes the most cooperative later, once we succeeded in answering their questions about the study.

For example, we discussed the study with the Board of one infant day care program at a meeting attended by several hundred people. The meeting was video-taped by a local T.V. station, which was making a documentary on how community-controlled organizations make decisions. In this case, the decision was whether to participate in the infant day care study or not. We were questioned by scores of people for more than three hours under hot kleig lights before television cameras. When the meeting was over, we were asked to submit a letter which specifically spelled out the purpose of the study, what participation in the study entailed for the day care program, the children, and their families. In addition, we were asked to put in writing commitments which we had made at the meeting, one of which was to provide feedback on children with health or developmental problems. We sent a letter, but there were further questions, which we were asked to reply to in a subsequent letter. We did so, and within a few weeks we received a letter from the Director informing us that the center would be pleased to participate in the study. Once the center had made the decision, it participated in the study whole-heartedly for more than five years until the study was completed. This center recruited 39 children into the study while an average of 14 children were recruited from each program in the study.

On the other hand, there were infant day care programs in the study that seemed very positive about it initially and raised very few objections, but recruited very few sample children into the study over a period of several years. There may be several reasons for this. In some cases, Directors may not have felt very positively about the study, but agreed to participate for political reasons, perhaps believing that future funding might be contingent on participation in the study. But their cooperation did not go beyond agreement to be in the study.

One day care program in the study, for example, would not allow members of the research staff to enter the center to pilot new procedures and measures and did not recruit any sample children into the study over a period of several years, despite many meetings with the Director to work out the problem. After a few years of fruitless effort, we informed the Director in writing that the deadline for recruiting sample children into the study was approaching. If sample children from this center were not recruited into the study by a certain date, it would be necessary to drop the program from the study. In response to the letter, the center recruited a number of children into the study and cooperated fully with our research staff for the remainder of the study.

We soon discovered that even whole-hearted acceptance of the study by the Director and Board did not necessarily insure that children would be recruited into the study. We anticipated that many families might choose not to participate in the study, which was their right. But we encountered another somewhat unexpected obstacle. In most day care programs, intake interviews were carried out by Family Counselors, who were often given the responsibility by the Directors for recruiting sample children into the study. If the Family Counselors did not accept the study, very few sample children were recruited into it, particularly in programs where the Directors did not exercise strong leadership. This occurred in several programs in the study. The only day care program which formally dropped out of the study may have done so because of a serious conflict between the Director, who seemed to be favorable to it, and key members of the staff who opposed it. We suspect that the Director decided to drop out of the study to avoid future conflict, which was understandable.

The Directors and Board members of the day care programs we had approached asked many questions about the study. We will report the issues which were most frequently raised, and how we dealt with them.

One of the first questions usually asked was, "What are we getting out of the study?" We responded to this question in terms of long-term and immediate benefits. In terms of long-range gains, the information from the study could be used to improve group and family infant day care programs in the future. Representatives from the day care programs in the study on the Policy Committee would have an opportunity to express their views about the policy implications of the study, which could have a more direct impact on their programs in the future.

One of the most important immediate benefits, which almost every day care program insisted upon, was that if a child in the study was found to have serious health or developmental problems, we would report such information as soon as possible to the day care program's Director, who would inform the parents. Although the research staff did not have the resources to treat the problem, and did not feel that it should accept such a responsibility, we did offer to provide Directors with information about where families could go for further diagnosis or treatment in their community. Unfortunately, we discovered that there were very few diagnostic or treatment facilities in New York City for children under three years of age with developmental problems.

While providing such information about children's health or developmental problems might affect the programs we were studying, from an ethical point of view, we felt that this should be done so that children could be treated as soon as possible. The Medical Director of the study reported developmental or health problems on 140 sample children. We incorporated this procedure into the study design: one measure of the quality of health care provided to children by the day care program was whether the information we provided was recorded in the child's health record, and whether there was appropriate follow-up.

Other questions which came up frequently were: "How do we know that the information you get from the study will not be used to cut the programs?" Or "What if you find that one type of day care program is better than the other?" Or "What if you find that infant day care is bad for babies?" We dealt with these questions in several ways. While we were comparing group and family day care infant day care programs, the study was designed to identify the strengths and weaknesses of these programs as they now exist, so that both types of day care programs can be improved in the future.

We dealt with the issue of the potential misuse of the information obtained from the study in another way. Through the Policy Committee all participants in the study would have the opportunity to become thoroughly familiar with and have an input into all aspects of the study, including interpreting and reporting the results of the study. We assured the Directors and Board members that before any findings from the study were reported publicly, either at professional meetings or in publications, the Policy Committee would have an opportunity to see and discuss the contents of the reports. However, we also made it clear that the findings would be reported as honestly, objectively, and constructively as possible. If there were short-comings in the infant day care programs as they now exist, this information should be used to improve the programs and not cut them. At the same time, we realized that once the results were made public, other people might attempt to use any negative findings from the study to cut programs. We had no easy solution to this dilemma, which troubled us a great deal, particularly during the recent drastic budget cuts in day care in New York City.

Directors and Board members also raised a particularly thorny question about the naturalistic observations. Our observers spent a whole day every six months observing the behavior of children and their caregivers in day care center classrooms and family day care homes. How would this information be used? What if our observers saw something happen that was detrimental to a child? What would they do about it?

We answered this question in several ways. If the child was in immediate physical danger(e.g. the child was about to swallow a pin or climb out of a window), when the caregiver was not in the room or seemed to be unaware of the danger we expected our Observers to act immediately to prevent a serious accident. On the other hand, our Observers were told not to meddle or assume any of the normal child-care responsibilities of the caregivers. In a few family day care homes the provider-mothers sometimes asked the observers to baby-sit while they went shopping or went to pick up another child at school. We instructed the Observers to politely refuse. While such requests were understandable, provider-mothers were not permitted to leave children in someone elses care, nor could we allow our Observers to assume the responsibility. In addition, of course, this would make it impossible to study the caregiver-child relationship, which was one of the most important reasons for making naturalistic observations.

A Director of a family day care program asked, "What if your Observer sees the provider-mother doing something that is really bad for the child? I certainly would want to know about it!" We used several arguments to convince Directorsand Board members that feedback on individual caregiver's behavior with children would not be helpful to the children in the long run, and would make it difficult to carry out this aspect of the study. We wanted the caregivers to be as natural as possible under the circumstances. This was possible only if the caregivers believed that our Observers were not there to judge them, or report what they do with babies to their Directors. The Directors knew their caregivers better than we did. Our Observers only visited a family day care home every six months, whereas the Education Aides from the center visited each home twice a week.

We also pointed out that our Observers were not child development specialists. They were college educated women who were trained to record their observations systematically. We could not, of course, prevent our Observers from having personal opinions about what they observed. But we tried to impress upon them that these views represented their personal child rearing ideas, which reflected their middle-class biases. The caregivers they were observing were usually women from a different class, and sometimes from a different ethnic group, who may have different views about child-rearing. Our Observers were told that under no circumstances were they to give child-rearing advise to caregivers, even if they were asked for it, nor were they to discuss the behavior of individual caregivers with anyone, including other members of the research staff. We told the Directors and Boards that we did not want our Observes to impose their ideas about what is good or bad for children on women who may have had a great deal more experience with babies than they did. [1]

Actually our Observers saw very few cases of gross mistreatment of children. In one instance, an Observer was very upset because a child she had observed in a family day care home was confined to a stroller in a fairly dark room for most of the day. She reported this incident to the senior members of the research staff to see if anything could be done about it. She was told that we could not report this incident to the Director, without compromising our relationships with all other caregivers in the study. We checked out the child's Bayley Mental scores and found that they were decreasing sharply with age. On these grounds we felt that we could report that the child was developing poorly to the Director so that something could be done about it, without directly criticizing the caregiver. We later learned that the child was transferred to another family day care home.

There was also an instance of child abuse, which we did not observe directly, but inferred from the pediatric examination of the child. We had no alternative but to report the case to the Director of the day care program. Both the Director and family day care provider-mother were aware of the problem, which they attributed to the child's mother. The mother was confronted with evidence of child abuse, which unfortunately could not be proven. The mother claimed that the child's injuries stemmed from falls. She was furious about the role we played, and removed her child from the study. This was one of the few cases in which a child dropped out of the study, without leaving the day care program.

Another question which was asked frequently concerned the family interviews. Parents might object to being asked a lot of personal questions. Was it necessary to include the family interviews? Families might be particularly sensitive about providing certain types of information (e.g. income data, questions about whether the parents were living together, etc.), which could affect the families eligibility for the program or public assistance.

We knew that the family development aspect of the study, which we considered extremely important, might turn families off to the study and make recruitment more difficult. We explained to Directors and Board members why it was necessary to include the family interviews. We believed that it was necessary to obtain information about the families for two reasons. In assessing the effects of day care on the child, it was essential to take into account the family's characteristics and influence on the child's development. We also felt that it was important to study the impact of infant day care on the family, which has generally been neglected in other studies. We assured the Directors and Board members that our interviewers were trained to deal with personal questions in a sensitive way and to accept the family's refusal to answer certain questions. We also assured them that the information we obtained from families would be completely confidential and not be made available to anyone.

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[1] Only 3 of the 6 Field Team Observers who worked on the study had children of their own.

Directors asked, "What if the family was in serious trouble and needed help?" We replied that if families expressed the need for help, either directly or indirectly, our interviewers would encourage them to discuss the problem with the Director or Family Counselor. But under no circumstances would the interviewers report such information directly to the Directors or Family Counselors or offer advise themselves. While the family interviews were the most difficult data to obtain, most of the families in the study did allow us to interview them.

Once a day care program entered the study, the children and families in the program could be recruited. The Directors or Family Counselors had the primary responsibility for recruitment, since it was not feasible for us to do so and they preferred to do it themselves.

In order to facilitate their task, we prepared a pamphlet, "Intake Procedures", which the Directors and Family Counselors could use when they discussed the study with parents. The pamphlet, which was printed in both English and Spanish. briefly described the study, and included intake, consent, and release forms for the parents to sign.

Before the final draft of "Intake Procedures" was distributed to the day care programs in the study, it was given to Policy Committee members and discussed at the Policy Committee meeting for reactions and recommendations. We wanted to make sure that the parents were provided with essential information about the study, and particularly what the participation of their children and family entailed in clear understandable lanaguage, so that they understood exactly what they were agreeing to in advance. We wanted parents to give their informed consent. Since this was a longitudinal study, where the children and familes would be studied over a period of several years, we did not want them to drop out of the study prematurely, due to a misunderstanding about what their participation in the study involved. Only three familes dropped out of the study because of their dissatisfaction with it, without leaving the day care program.

Since we relied on the Directors and Family Counselors to do the recruiting, and the sample came in more slowly than we had anticipated, it was necessary for us to exert a constant but gentle pressure on them to recruit as many new children and families who entered their programs into the study as possible during the three-year recruitment period. We did this in several ways. At every Policy-Committee meeting, we discussed the problem and solicited their ideas about how to deal with it. Usually this resulted in a spurt in recruitment. Members of our research staff maintained monthly contact with Directors or Family Counselors of each of the infant day care programs in the study to find out if any new children had entered the program recently, and whether the parents had been approached about the study. These monthly contacts were important to remind Directors and Family Counselors, who had many other problems to deal with, to discuss the study with new prospective families. Often the study was not discussed with parents until after the children had entered the program. Since parents did not always pick up their children themselves or had very little time to discuss the study at the center, it became necessary for the Family Counselors to visit the families at home in the evening to discuss the study. In such cases, we reimbursed the Family Counselors for their travel expenses and time from project funds, which was one of the recommendations made by the Policy Committee.

The 31 infant day care programs in the study differed greatly, in terms of the number of children they recruited, ranging from 6 to 39 children, with an average of about 14 children recruited into the study from each program.

It was necessary to recruit additional preschool day care programs into the study to obtain the number of 36-month cross-sectional children we needed. While we found it much easier to recruit the older more established preschool programs into the study, the recruitment of 36-month cross-sectional children was more difficult.

The boards of the more established preschool day care programs seemed less politically-oriented and the Directors seemed to have more autonomy in making decisions, such as whether to participate in the study. The Directors were also more favorable to research in their centers. Within a few months, from April to September 1976, we were able to recruit 21 preschool programs into the study. Of course, in comparison to the relatively small number of infant day care programs in New York City, there was a much larger pool of preschool programs, which made our task much easier.

Recruitment of 36-month cross-sectional children from these programs, however. was more difficult for several reasons. We discovered that only about a third of the three year old children who were entering a day care program for the first time were cared for at home by their families during the first 2½-3 years of life, which was our criteria for acceptance into the 36-mouth cross-sectional sample.

We were also faced with a more serious problem in recruiting the 36-month cross-sectional sample, due to the impact of the fiscal crisis in New York City on day care. We began to recruit additional preschool programs into the study in the Spring of 1976, and anticipated that we would have no difficulty recruiting the additional 50-75 cross-sectional children we needed during the Summer and early Fall when most children enter day care programs here. After months of rumors about the closing of more day care centers, in July 1976, 49 day care centers were closed, including four of the infant centers that were in the study and several of the preschool programs that had agreed to participate in it. [2] The day care programs also lost their Family Counselors, who had been doing intake interviews with families and recruitment of children into the study. In addition, after July 1, a new untried method of doing the intake and eligibility interviews with familes was instituted, which greatly slowed down the entry of new three year old children into day care. Intake into family day care was completely frozen indefinitely, which meant that we could only recruit 36-month cross-sectional children from group day care.

We had planned to stop recruiting 36-month cross-sectional children into the study at the end of September 1976. However, because of the problems we have described, in order to obtain an adequate number of such children, it became necessary for us to extend recruitment and data collection on the 36-month cross-sectional sample by a few months.

Despite all of these difficulties, we succeeded in recruiting 31 infant day care programs, 21 preschool day care programs, and 516 children and their families into the study.

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[2] Fifty-five day care centers were previously closed in July 1975.

CHAPTER 5 - CHILDREN AND FAMILIES IN STUDY

In studying infant day care programs and their effects on children's development during the first three years of life, we distinguished between the following two periods: (1) the first 18 months, which represents the sensorimotor or preverbal period; and (2) from 18 to 36 months of age, when children's experience and behavior are increasingly influenced by language. The effects of children's infant day care experience on their development were assessed at two key ages: at approximately 18 and 36 months of age.

We obtained 18-month developmental measures on 318 children, with different types and varying amounts of infant day care experience, whom we refer to as the Eighteen-Month Sample. We obtained 36-month developmental measures on 259 children, with different types and varying amounts of infant day care experience, whom we refer to as the Thirty-Six Month Sample. [1]

The Eighteen-Month Sample consisted of the following three major sub-samples, who were compared on various aspects of development at approximately 18 months of age: (1) The Eighteen-Month Longitudinal Group Day Care Sample included 107 children who entered a group day care program between two and 14 months of age and were longitudinally studied until about 18 months; (2) the Eighteen-Month Longitudinal Family Day Care Sample included 142 children who entered a family day care program between two and 14 months of age and were longitudinally studied until about 18 months; and (3) the Eighteen-Month Cross-Sectional Sample included 69 children who entered a group or family day care program between 15 and 21 months of age. The difference in the number of children in the three 18-month samples reflects the fact that there were more children under 18 months of age in family day care than in group day care programs in New York City, and more children entered these programs during the first year than the second year of life.

The Thirty-Six Month Sample [2] consisted of the following three major sub-samples, who were compared on various aspects of development at approximately 36 months of age: (1) the Thirty-Six Month Longitudinal Group Day Care Sample included 87 children who entered a group day care program between 2 and 21 months of ago and were longitudinally studied until about 36 months of age; (2) the Thirty-Six Month Longitudinal Family Day Care Sample included 94 children who entered a family day care program between 2 and 21 months of age and were longitudinally studied until about 36 months; and (3) the Thirty-Six Month Cross-Sectional Sample included 78 children who were reared at home by their own families during the first 2½ years of life and first entered a group or family day care program [3] between 30 and 40 months of age. (The distribution of children in various samples are presented in Table 5-1 and 5-7),

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[1] One hundred nineteen children left the program before 18 months or were dropped from the study by us because they were too young to be evaluated on the 18-month developmental measures when it was necessary to stop collecting this data. One hundred thirty-seven children, who were in the 18-month sample, left the program before 36 months or were dropped from the study by us because they were too young to be evaluated on the 36-month developmental measures when it was necessary to stop collecting this data. Children on whom we did not obtain 18 or 36 month developmental measures were not included in these samples. Only three children dropped out of the study, without leaving the program, because their parents were dissatisfied with the study.

[2] The 181 children in the Thirty-Six Month Group and Family Longitudinal Samples were children in the Eighteen-Month Sample, including the Eighteen-Month Cross-Sectional Sample, who we were able to study longitudinally until three years of age.

These were the only criteria we used for selecting the foregoing samples. Since participation in the study was necessarily voluntary, the samples were not randomly selected; nor was it feasible for us to match the three 18-month samples or three 36-month samples to be compared, in terms of various demographic characteristics.

The basic strategy which we employed was to attempt to recruit all children in the day care programs in the study who met our criteria. Demographic or initial characteristics in which the three 18-month samples or three 36-month samples differed significantly would be statistically controlled for in subsequent comparisons among the three sub-samples, when such control was appropriate.

Children and families were compared on 17 demographic and initial characteristics to see whether the three 18-month samples or three 36-month samples differed significantly in any of these respects before they entered the day care program. (The 17 variables are listed in Table 2-2).

Children were compared in terms of sex, ethnicity, intellectual development, and physical health and growth, including whether there was a history of low birth weight or birth complications. Families were compared in terms of socio-economic status and economic resources, family composition, and various aspects of family functioning, including how different members of the family relate to one another. Data on the demo-graphic and initial characteristics of the Eighteen and Thirty-Six Month Samples are presented in a series of Tables at the end of this chapter.

Here we will report significant initial differences which were present among the three 18-month samples and among the three 36-month samples. We will also describe the general demographic characteristics of the children and families in the study, and compare them to the total public day care population in New York City, when comparative demographic data is available from other sources, in order to see whether our sample is representative.

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[3] Sixty-six of the 78 children in the Thirty-Six Month Cross-Sectional Sample were recruited from group day care programs. The reasons why most of these children came from group day care programs were discussed in the previous chapter.

It is important to keep in mind that demographic differences among different samples in the study may or may not reflect similar differences in the total public day care population in New York City. That is, demographic differences between the Group and Family infant day care samples or differences between children who entered these programs at different ages may not necessarily be present in the total day care population. Therefore, unless demographic differences among different samples in the study are confirmed by information from other sources, we will not draw inferences from such differences, but will simply report them here. The same is true for the general description of the demographic characteristics of the children and families in the study.

The Eighteen-Month Samples differed significantly in the following three initial characteristics:

1. Ethnicity. There were significant differences among the three groups (Longitudinal Group, Longitudinal Family, and Cross-Sectional Samples) in their ethnic distribution ($R=.193$, $F_{2,270} = 5.22$, $P \leq .01$). There was a higher proportion of Black vs. Hispanic children in the Group and Cross-Sectional Samples, whereas there was a higher proportion of Hispanic than Black children in the Longitudinal Family Day Care Sample. In the Group Day Care Sample 58 percent of the children were Black and 28 percent were Hispanic. In the Family Day Care Sample, 39 percent of the children were Black and 47 percent were Hispanic. (See Table 5-3).

While the Agency for Child Development, which funded these programs, did not routinely keep ethnic data on the children in its day care programs, the Director of the Family Day Care programs provided us with such information from a 1974 survey of the ethnic distribution of children in the family day care programs. Ninety-seven percent of the children in ACD funded family programs in 1974 were Black or Hispanic: 65 percent of the children were Black and 32 percent were Hispanic, which was similar to the ethnic ditribution of the children in the Group Day Care Sample in our study. These figures indicate that the Family Day Care Sample in the study was not representative of the total family day care population in terms of ethnicity. Although we did not have comparable ethnic data on the group day care programs funded by ACD, we had the impression from people who worked in these programs that most children in them were Black or Hispanic, with a higher proportion of Black than Hispanic children. Therefore, it is likely that the Longitudinal Group and Cross-Sectional Samples in the study were fairly representative of the total day care population, whereas there was a higher proportion of Hispanic children and a lower proportion of Black children than would be expected in the Family Day Care Sample.

2. Psychological Development: In comparing the initial Bayley Mental Scores of children in the two types of day care programs and the Cross-Sectional Sample, it was found that their scores differed

significantly ($R=.462$, $F_{2,210} = 28.44$, $P \leq .01$). This difference is attributable to the fact that the 18 month Cross-Sectional Sample had significantly lower scores than both the Group ($pr=.358$, $t_{210} = 5.56$, $P \leq .01$) and Family ($pr=.448$, $t_{210} = 7.26$, $P \leq .01$) Longitudinal Samples. The initial Bayley scores for the Longitudinal Group, Family, and Cross-Sectional Samples were 108.5, 112.5, and 93.1 respectively (see Table 9-2).

3. Sources of Income: There were also significant differences among the three 18-month samples in the proportion of families who were totally self-supporting (i.e. not receiving an public assistance) before they entered the day care program ($R=.20$, $F_{2,250} = 5.21$, $P \leq .01$). Eighty-one percent of the Family Day Care families, 69 percent of the Group Day Care families, and 72 percent of the Cross-Sectional families were completely self-supporting initially. (See Table 11-2).

While we did not have comparable data on the proportion of self-supporting families in different types of day care programs or families whose children entered these programs at different ages, we did have information about the proportion of all families in ACD funded day care programs who were self-supporting in 1975. (Kazajian et al, 1975). Whereas 63 percent of all families using ACD funded day care services were self-supporting, 71 percent of the families in the 18-month samples in the study were self-supporting before they entered the program, indicating that a somewhat higher proportion of families in the study were self-supporting than would be expected.

In subsequent comparisons of the three 18-month samples the foregoing variables on which they significantly differed initially were statistically controlled for, when it was appropriate to do so.

The Thirty-Six Month Samples differed significantly in the following initial characteristics, some of which were similar to initial differences among the 18-month samples, described earlier.

1. Birth History: The Group Longitudinal, Family Longitudinal, and Cross-Sectional Samples had significantly different birth histories ($R=.173$, $F_{2,234} = 3.59$, $P \leq .05$). A higher proportion of the Longitudinal Group Day Care children had normal birth histories (i.e. normal birth weight, without complications) than did the Longitudinal Family Day Care and Cross-Sectional Samples, who did not differ greatly in this respect. Sixty-seven percent of the Group Day Care, 49 percent of the Family Day Care, and 49 percent of the Cross-Sectional children had normal birth histories (See Table 6-4). Whereas the 18-month Longitudinal Group and Family Day Care children did not differ in this respect, a higher proportion of children with abnormal birth histories dropped out of the group than the family day care programs before 36 months of age. While comparable birth history data were not available on the total public day care population in New York City, Pasamanick et al (1956) found in their well-known Baltimore study that the incidence of birth complications (including low birth weight) was approximately 50 percent for minority children, which is comparable to the incidence in the Family Day Care and Cross-Sectional Samples in the study, but higher than the incidence of complications in the Group Day Care Sample.

2. Physical Growth: Children in the three 36-month samples were found to differ significantly in their height ($R=.203$, $F_{2,181} = 3.88$, $P\leq .05$) and weight ($R=.302$, $F_{2,180} = 9.01$, $P\leq .01$). Children in the Cross-Sectional Sample were shorter and lighter for their age, when they were first measured at 36 months of age, than children in the Longitudinal Group and Family Day Care Samples, when they were first measured at 6, 12, or 18 months of age, shortly after they entered the day care program (See Tables 6-13 through 6-16).

3. Ethnicity: As in the case of the 18-month samples, there was a significant difference in the ethnic distribution of the three 36-month samples ($R=.187$, $F_{2,215} = 3.90$, $P\leq .05$). There was a higher proportion of Hispanic than Black children in the Longitudinal Family Day Care Sample, whereas the reverse was true for the Longitudinal Group Day Care and Cross-Sectional Samples. The proportions of Black and Hispanic children in the three 36-month samples were similar to the proportions in the three 18-month samples. (See Table 5-9).

4. Sources of Income: Families in the three 36-month samples showed significant differences in their sources of income ($R=.283$, $F_{2,211} = 9.17$, $P\leq .01$). As in the case of the 18-month samples, a higher proportion of the families in the Family Day Care Sample were self-supporting than in the Group Day Care Sample, which in turn had a higher proportion of self-supporting families than the Cross-Sectional Sample. The percentages of self-supporting families in the Family Day Care, Group Day Care, and Cross-Sectional Samples were 81 percent, 63 percent and 50 percent respectively. (See Table 11-3).

5. Mother's Age: There were significant differences among the mothers of the children in the three 36-month samples in their age when the sample child was born ($R=.178$, $F_{2,238} = 3.92$, $P\leq .05$). The mothers in the Cross-Sectional Sample were younger when the sample children were born than the mothers in the Group and Family Day Care Sample, who did not differ greatly in this respect. The mean ages of the mothers in the Group Day Care, Family Day Care, and Cross-Sectional Samples were 26.3, 26.5, and 24.1 years respectively. (See Table 5-10).

In subsequent comparisons of the three 36-month samples, the foregoing variables on which they significantly differed intially were statistically controlled for, when it was appropriate to do so.

We will now describe the general initial demographic characteristics of the children and families in the study, and compare them to the total public day care population, where such comparative demographic data were available. In order to avoid redundancy, we will describe the 318 children and families in the Eighteen-Month Sample, which includes the Thirty-Six Month Longitudinal Group and Family Day Care Samples. We have already mentioned the few significant demographic differences between the 36-month Cross-Sectional Sample and the Longitudinal Group and Family Day Care Samples. The data pertaining to children's initial nutrition status, physical health and growth will be described in greater detail in Part Two of this report.

Children's Characteristics

1. Sex

The children were about equally divided in terms of sex: 52% of the children were boys and 48% were girls. (See Table 5-2).

2. Ethnicity

As we indicated earlier, most of the children were Black or Hispanic, with a somewhat higher proportion of Black than Hispanic children: 86% of the children were Black or Hispanic; 47% were black and 39% were Hispanic. (See Table 5-3). While there were no comparable ethnic data available for the total public day care population in New York City, in a 1974 survey of children in the family day care programs here, 97% of the children were Black or Hispanic; 65% were Black and 32% were Hispanic.

Family Characteristics

1. Socio-Economic Status and Economic Resources

a. Socio-Economic Status

We used Hollingshead's (1965) Two-Factor Index of Social Position, which was based on parent's education and occupation, to determine the social class of the families in the study. On the basis of the index score, a family was assigned to one of five classes, with I representing the highest Class and V representing the lowest Class, in terms of socio-economic status. Ninety percent of the families in the study were in Hollingshead's Classes IV and V before they entered the program, with 53 percent from Class V. Most of the families in the study would be defined as working class or lower class families, while less than 10 percent of the families would be considered middle-class (See Table 11-6 through 11-10).

b. Income

The mean gross annual rate of income for the families in the study before they entered the program was $7,238 which indicates that most of the families were within the $9,400 net income limit permitted for 4-person families eligible for public day care services in New York City in 1975. (Kazajian et al, 1975).

c. Sources of Income

Seventy-one percent of the families in the study were completely self-supporting before they entered the program, 13 percent were receiving supplimental public assistance, and 16 percent were totally dependent on public assistance. According to a report by Kazajian et al prepared for ACD in 1975, 63 percent of all families using public day care services in New York City were self-supporting, which indicates that a somewhat higher proportion of the families in the study were self-supporting than would be expected.

2. Family Composition

a. Family Structure

Fifty-one percent of the families in the study were two-parent nuclear families. (See Tables 11-11 to 11-15). The percent of Nuclear families in the study was higher than the 30 percent of two-parent families reported by Kazajian et al (1975) of all families in ACD funded day care programs in New York City in 1975.

b. Family Size

(1) Number of Children

Ninety-one percent of the families in the study had three children or less, including the sample child, and 40 percent of the sample children had no siblings. (See Table 5-5).

(2) Number of People in Family

Eighty-eight percent of the families in the study had five or fewer people living in the home, including adults and children. (See Table 5-6). The families in the study were comparable in this respect to the families in the total day care population, where 90 percent of all families using public day care facilities in New York City in 1975 consisted of 5 or fewer people. (Kazajian et al, 1975).

c. Mother's Age

As one would expect, most of the sample mothers were fairly young. Eighty-two percent were in the 19 to 34 year optimal child-bearing age group when the study children were born. (See Table 5-4). Ten percent of the mothers were 18 years old or less when they gave birth, and 8 percent were over 35 years old. Forty percent of the mothers were primiparas, i.e. the child who participated in the study was their first child.

To summarize the initial demographic characteristics of the children and families in the study: the children were about equally divided in terms of sex. Most of the children were Black or Hispanic, with a somewhat higher proportion of Black than Hispanic children. Most of the families in the study were working-class or lower-class, low-income, self-supporting families. About half of families in the study were two-parent nuclear families, with one or two children. Most of the mothers were in the 19 to 34 optimal child-bearing age, and almost half of the mothers had given birth to only the child in the study.

Table 5-1

Distribution of Children in Eighteen-Month Sample

AGE OF ENTRY INTO DAY CARE

SAMPLE	2-9 Mos.	10-14 Mos.	15-21 Mos.	TOTAL
Eighteen-Month Longitudinal Group Day Care Sample	[a] (57) 53.3%	(50) 46.7%	(0) 0.0%	(107) 33.6%
Eighteen-Month Longitudinal Family Day Care Sample	(90) 63.4%	(52) 36.6%	(0) 0.0%	(142) 44.7%
Eighteen-Month Cross-Sectional Sample	(0) 0.0%	(0) 0.0%	(69) 100.0%	(69) 21.7%
TOTAL	(147) 46.2%	(102) 32.1%	(69) 21.7%	(318) 100.0%

a. Frequencies are reported in brackets ( ).

b. Entered group or family day care program between 15 and 21 months of age.

Table 5-2

Sex Distribution of Children in Eighteen-Month Sample

SAMPLE	SEX Male	 Female
Eighteen-Month Longitudinal Group Day Care Sample	(53) a 50.5% b	(52) 49.5%
Eighteen-Month Longitudinal Family Day Care Sample	(72) 51.4%	(68) 48.6%
Eighteen-Month Cross-Sectional Sample	(37) 53.6%	(32) 46.4%
TOTAL	(162) 51.6%	(152) 48.4%

N = 314

Table 5-3

Ethnic Distribution of Children in Eighteen-Month Sample

SAMPLE	ETHNIC CATEGORY Black English-Speaking	Hispanic	Other English-Speaking	Other Bilingual
Eighteen-Month Longitudinal Group Day Care Sample	(62) a 57.9%	(30) 28.0%	(4) 3.7%	(11) 10.3%
Eighteen-Month Longitudinal Family Day Care Sample	(55) 38.7%	(66) 46.5%	(13) 9.2%	(8) 5.6%
Eighteen-Month Cross-Sectional Sample	(33) 47.8%	(27) 39.1%	(5) 7.2%	(4) 5.8%
TOTAL	(150) 47.2%	(123) 38.7%	(22) 6.9%	(23) 7.2%

N = 318

Table 5-4

Mother's Age When Children in the Eighteen-Month Sample Were Born

SAMPLE	MOTHER'S AGE WHEN SAMPLE CHILD WAS BORN Under 19 years	 19-24 years	 25-34 years	 Over 35 years
Eighteen-Month Longitudinal Group Day Care Sample	(11) a 11.5%	(30) 31.3%	(46) 47.9%	(9) 9.4%
Eighteen-Month Longitudinal Family Day Care Sample	(16) 12.1%	(46) 34.8%	(59) 44.7%	(11) 8.3%
Eighteen-Month Cross-Sectional Sample	(2) 3.4%	(20) 33.9%	(34) 57.6%	(3) 5.1%
TOTAL	(29) 10.1%	(96) 33.4%	(139) 48.4%	(23) 8.0%

N = 287

Table 5-5

Number of Siblings of Children in Eighteen-Month Sample

	AGES								
SAMPLE	0 - 5 Years			6 - 17 Years			Total Number of Siblings		
	0	1	2+	0	1	2+	0	1	2+
Eighteen-Month Longitudinal Group Day Care	(59) a 60.8%	(29) 29.9%	(9) 9.3%	(71) 73.2%	(21) 21.6%	(5) 5.2%	(35) 36.5%	(37) 38.5%	(24) 25.0%
Eighteen-Month Longitudinal Family Day Care	(83) 62.4%	(40) 30.1%	(10) 7.5%	(107) 80.5%	(11) 8.2%	(15) 11.3%	(63) 47.4%	(37) 27.8%	(33) 24.8%
Eighteen-Month Cross-Sectional	(31) 50.8%	(24) 39.3%	(6) 9.9%	(39) 63.9%	(14) 23.0%	(8) 13.1%	(19) 31.1%	(19) 31.1%	(23) 37.8%
TOTAL	(173) 59.4%	(93) 32.0%	(25) 8.6%	(217) 74.6%	(46) 15.8%	(28) 9.6%	(117) 40.3%	(93) 32.1%	(80) 27.6%

Table 5-6

Total Number of Persons in Eighteen-Month Sample Families

SAMPLE	NUMBER OF PERSONS 2	 3	 4	 5	 6 or more
Eighteen-Month Longitudinal Group Day Care Sample	(14) a 14.4%	(22) 22.7%	(36) 37.1%	(14) 14.4%	(11) 11.3%
Eighteen-Month Longitudinal Family Day Care Sample	(21) 15.8%	(41) 30.8%	(34) 25.6%	(20) 15.0%	(17) 12.9%
Eighteen-Month Cross-Sectional Sample	(9) 14.8%	(17) 27.9%	(14) 23.0%	(14) 23.0%	(7) 11.4%
TOTAL	(44) 15.1%	(80) 27.5%	(84) 28.9%	(48) 16.5%	(35) 12.0%

N = 291

Table 5-7

Distribution of Children in Thirty-Six Month Sample

SAMPLE	AGE OF ENTRY INTO DAY CARE 2-9 months	10-14 months	15-21 months	30-40 months	TOTAL
Thirty-Six Month Longitudinal Group Day Care Sample	(27) 31.0%	(32) 36.8%	(28) 32.2%	(0) 0.0%	(87) 33.6%
Thirty-Six Month Longitudinal Family Day Care Sample	(54) 57.4%	(21) 22.4%	(19) 20.2%	(0) 0.0%	(94) 36.3%
Thirty-Six Month Cross-Sectional Sample[a]	(0) 0.0%	(0) 0.0%	(0) 0.0%	(78) 100.0%	(78) 30.1%
TOTAL	(81) 31.3%	(53) 20.5%	(47) 18.1%	(78) 30. 1%	(259) 100.0%

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[a] Entered group or family day care program between 30 and 40 months of age. Cared for at home by their own families during first 2½- 3 years of life.

Table 5-8

Sex Distribution of Children in Thirty-Six Month Sample

SAMPLE	SEX Male	 Female
Thirty-Six Month Longitudinal Group Day Care Sample	(46) a 53.5%	(40) 46.5%
Thirty-Six Month Longitudinal Family Day Care Sample	(43) 45.7%	(51) 54.3%
Thirty-Six Month Cross-Sectional Sample	(34) 44.2%	(43) 55.8%
Total	(123) 47.9%	(134) 52.1%

N = 290

Table 5-9

Ethnic Distribution of Children in Thirty-Six Month Sample

	ETHNIC CATEGORY			
SAMPLE	Black English-Speaking	Hispanic	Other English-Speaking	Other Bilingual
Thirty-Six Month Longitudinal Group Day Care Sample	(50) 58.1%	(27) 31.4%	(1) 1.2%	(8) 9.3%
Thirty-Six Month Longitudinal Family Day Care Sample	(34) 36.2%	(42) 44.7%	(9) 9.6%	(9) 9.6%
Thirty-Six Month Cross-Sectional Sample	(41) 53.9%	(24) 31.6%	(7) 9.2%	(4) 5.3%
TOTAL	(125) 48.8%	(93) 36.3%	(17) 6.6%	(21) 8.2%

N = 256

Table 5-10

Mothers' Age When Children in the Thirty-Six Month Sample Were Born

	MOTHERS' AGE WHEN SAMPLE CHILD WAS BORN			
SAMPLE	Under 19 Years	19-24 Years	25-34 Years	Over 35 Years
Thirty-Six Month Longitudinal Group Day Care Sample	(6) a 7.4%	(23) 28.4%	(46) 56.8%	(6) 7.4%
Thirty-Six Month Longitudinal Family Day Care Sample	(7) 7.9%	(31) 34.8%	(42) 47.2%	(9) 10.1%
Thirty-Six Months Cross-Sectional Sample	(14) 19.7%	(27) 38.0%	(25) 35.2%	(5) 7.0%
TOTAL	(27) 11.2%	(81) 33.6%	(113) 46.9%	(20) 8.3%

N = 241

Table 5-11

Number of Siblings of Children in Thirty-Six Month Sample

SAMPLE	AGES						Total Number of Siblings		
	0 - 5 Years			6 - 17 Years					
	0	1	2+	0	1	2+	0	1	2+
Thirty-Six Month Longitudinal Group Day Care	(44) a 53.0%	(28) 33.7%	(11) 13.3%	(55) 66.3%	(19) 22.9%	(9) 10.8%	(25) 30.5%	(28) 34.1%	(29) 35.4%
Thirty-Six Month Longitudinal Family Day Care	(54) 59.3%	(32) 35.2%	(5) 5.5%	(69) 75.8%	(16) 17.6%	(6) 6.6%	(39) 42.9%	(32) 35.2%	(20) 21.9%
Thirty-Six Month Cross-Sectional	(36) 54.5%	(23) 34.8%	(7) 10.6%	(39) 59.1%	(14) 21.2%	(13) 19.7%	(19) 28.4%	(25) 37.3%	(23) 34.3%
TOTAL	(134) 55.8%	(83) 34.6%	(23) 9.6%	(163) 67.9%	(49) 20.4%	(28) 11.7%	(83 34.6%	(85) 35.4%	(72) 30.0%

Table 5-12

Total Number of Persons in Thirty-Six Month Sample Families

	NUMBER OF PERSONS				
SAMPLE	2	3	4	5	6 or more
Thirty-Six Month Longitudinal Group Day Care Sample	(10) a 12.0%	(18) 21.7%	(30) 36.1%	(13) 15.7%	(12) 14.4%
Thirty-Six Month Longitudinal Family Day Care Sample	(15) 16.5%	(30) 33.0%	(26) 28.6%	(13) 14.3%	(7) 7.7%
Thirty-Six Month Cross-Sectional Sample	(8) 11.9%	(18) 26.9%	(18) 26.9%	(14) 20.9%	(9) 12.5%
TOTAL	(33) 13.7%	(66) 27.4%	(74) 30.7%	(40) 16.6%	(28) 11.6%

N = 241

CHAPTER 6 PHYSICAL HEALTH AND GROWTH OF CHILDREN IN STUDY

The low-income Black and Hispanic children in the study, who comprise approximately 90% of the children in public day care programs in New York City and in our sample, represent a potentially high risk group in terms of a higher incidence of low birth weight and birth complications, poor physical health and growth, as well as poor nutrition and health care (Birch and Gussow, 1970).

Since these physical health factors can affect all aspects of children's development, it was essential to see whether there were any initial differences in these respects between children in the group and family infant day care samples in the study, so that such differences could be statistically controlled for in assessing the impact of the two types of day care programs on children's subsequent development.

It was also important to find out how the children in the study compared to similar low-income minority children who were not in an infant day care program, in order to see whether our sample was representative in terms of the incidence of low birth weight, birth complications, medical problems, as well as physical growth.

We also wanted to identify the specific types of medical problems which the children in the study presented, so that future health care for children in infant day care programs can be geared to dealing with such problems.

Since most of the medical problems which we were able to assess were unlikely to be affected by children's subsequent infant day care experience, we did not study the impact of the two types of day care programs on children's physical health. However, we examined the day care agencies' health records to see whether the agencies knew about medical problems of children in their programs that our study pediatricians had detected. This was one of the indices used for assessing the quality of health care provided to babies in the two types of infant day care programs. However, we did study the effects of the two programs on children's physical growth.

Infant day care programs have a unique opportunity to improve the nutrition and health care of the children they serve. The study was designed to see whether the group and family infant day care programs differed in these respects.

In this chapter we will describe the physical health and growth of the children in the study. In subsequent chapters we will deal with the nutrition, health care, and safety provided to children in the group and family infant day care programs in the study.

Methods

The methods of obtaining and coding medical data in the study were developed by the study Medical Committee, whose members included the Project Medical Director, several key members of the research staff, the Director and Assistant Director of the NYC Health Department's Bureau of Child Health, as well as a few outside medical consultants. The pediatric consultant to the study was Dr. Herbert Birch, who played a key role in the development of the medical procedures used in the study until his untimely death in 1974. The Medical Committee met regularly throughout the study, from its inception until the Final Report was completed.

The NYC Health Department also contributed materially to the collection of the medical data. In addition to contributing part of the Medical Director's salary, the Health Department provided the doctors who carried out the pediatric examinations of the children in the study. The Department also provided specialists who trained the study staff to do the 36-month visual, auditory, and dental screenings. Some of the auditory and dental screenings were carried out by specialists. The Health Department also arranged to have children's blood specimens obtained during pediatric examinations to be analyzed in its laboratory.

The medical data on the children in the study were obtained from the following sources: (A) Prenatal and Birth Records; (B) Pediatric Examinations; and (C) Laboratory Reports, based on blood samples collected during the pediatric examinations. In addition, day care agencies' health records were obtained for each child in the study, which were used to assess the quality of health care provided to children in the two types of infant day care programs.

When a child entered the study, the mother was asked to sign consent and release forms to permit us to examine the child, to obtain blood samples, and to obtain medical information from sources of prenatal care, birth records, as well as day care agency health records.

A. Prenatal and Birth Records

Prenatal and birth records were obtained for as many sample children as possible to determine whether the child was at-risk in terms of low birth weight and birth complications.

Mothers were asked to provide information on the release forms about where they received their prenatal care and in which hospital the sample child was born. Initially we attempted to obtain prenatal and birth records by mail. In cases where repeated attempts by mail and telephone calls failed to procure these records, we sent registered nurses on our research staff into hospital record rooms in New York City hospitals to abstract the information we needed.

We encountered several types of problems in obtaining this information. In some cases the mothers gave us the name of the wrong hospital, where perhaps another child was born. A more common problem was that the mother's and child's hospital records were kept in separate files, with different identification numbers and often in different locations in the hospital. Knowing the child's birth date was sometimes inadequate to locate the birth records, which were filed by the date the child was discharged from the hospital. Hospitals vary greatly in terms of the filing system used, as well as in the completeness of the information in the records. Prenatal information ranged from detailed records of monthly visits to summaries stating merely that the "prenatal course was uneventful." However, if no mention was made of the prenatal history in the hospital record, it was treated as missing data. Some of the children were born outside of New York City or outside of the United States, which made it difficult to obtain these records. Despite these problems, we succeeded in obtaining prenatal and birth data on about 90% of the children in the study.

The prenatal and birth records were coded by a registered nurse on our research staff, under the supervision of the study Medical Director, into the following four categories:

(1) Normal Birth Weight, Without Complications (Birth weight at least 5 lbs.)

(2) Normal Birth Weight, With Complications

(3) Low Birth Weight, Without Complications (Birth weight from 3½ to 5 lbs. with gestation age more than 32 weeks)

(4) Low Birth Weight, With Complications (Birth weight less than 3½ lbs. and/or gestation age 32 weeks or less)

The Medical Committee decided to use less than 5 lbs., rather than the usual 5½ lbs., to define low birth weight in this study, since most of the sample were low-income Black and Hispanic children, who tend to have somewhat lower birth weights.

Birth complications included such at-risk factors as: mother's age less than 15 or over 40 years; parity of 5 or more; two or more previous spontaneous abortions; certain chronic illnesses, such as tuberculosis; fetal distress during delivery, etc. A complete list of the 50 specific birth complications and at-risk factors coded is presented in Table 6-1.

B. Pediatric Examinations

Comprehensive systematic pediatric examinations were carried out by physicians on our research staff of each sample child at approximately 6, 12, 18, and 36 months of age. The pediatricians used detailed protocols for carrying out these examinations and recording their findings, in order to insure thoroughness and uniformity in the data collected (The protocols were submitted to our funding agencies in Appendix B of the November 1974 Suppliment to the Progress Report).

The examinations were conducted in group day care centers or family day care centers in a room which provided as much privacy as possible. Children and caregivers in the family day care programs were provided with taxi transportation. Each pediatric examination required about one hour for each child, so that only two or three children could be seen by the pediatrician in a morning or afternoon session.

The examination sessions were scheduled and coordinated by paraprofessional medical aides on our research staff, who also functioned as assistants to the physicians during the pediatric examinations. The aides were trained to obtain height, weight and head circumference measurements on the children, and perform the visual screening of children at 36 months of age. The aides were also responsible for delivering the blood samples obtained each day to the Health Department laboratory for analysis. At least one of the aides was fluent in both English and Spanish, so that there would be no problem in communicating with Hispanic caregivers or children.

In accordance with the study design, our pediatricians did not obtain a medical history on the children, nor were the results of the medical examination of a non-emergency nature conveyed to the day care agency's Director or parent at the conclusion of the examination. However, after reviewing each child's completed medical protocol, the study Medical Director decided whether to report problems to the day care program Director for further diagnosis or treatment.

Completed pediatric protocols were submitted to the study Medical Director for review, disposition of detected medical problems, and for diagnostic coding. Each protocol was coded into one of the following three diagnostic categories:

1. Normal - No medical abnormalities detected
2. Minor Abnormality - These include abnormalities which do not seriously impair the child's current health, and do not require further diagnosis or major treatment at the present time; nor are serious impairment or major treatment regarded as necessary or inevitable in the future. Most commonly diagnosed minor abnormailities include refractive errors, innocent murmurs, etc.
3. Major abnormality - These include abnormalities which may seriously impair the child's current health and/or require further diagnosis or major treatment at the present time; or where serious future impairment and/or major treatment are inherently implied in the diagnosis. These include hearing impairment, organic heart murmurs, hypertension, etc.

The abnormalities were further classified into:

1. Definite Abnormality - These include physical findings which did not require further confirmation of their presence or abnormal nature.

2. Suspected Abnormality - These include physical findings which were not sufficient to classify them as definite abnormalities, without further confirmatory evaluation or evidence.

   Since there were no treatment group differences in the percentages of definite and suspected abnormalities, we included the suspected with the definite abnormalities for data analytic purposes. It is important to keep in mind, however, that by including the suspected with the definite abnormalities, the incidence of medical abnormalities in our study sample was somewhat inflated.

The clinical diagnostic codes used in the present study (See Table 6-2) were adapted from those employed in the New York Hospital Welfare Medical Care Project. Diagnostic codes excluded, by design, acute illnesses, such as respiratory infections, since it was felt that it would be meaningless to include acute conditions that by chance were found to be present at the time of the physical examination. Originally we had planned to obtain data from the day care agencies' records on the types and frequency of acute illness and the rate of absenteeism due to acute illness. It became apparent early in the study that we could not get reliable data. Record keeping of absences, including reasons for absences, was found to be inadequate for our purpose. Agencies with well-kept attendance records might appear to have a higher incidence of absences due to acute illnesses than agencies with poorly kept records. Therefore, the study design was revised to include only non-acute medical problems. Since most of these were unlikely to be affected by children's infant day care experience, we did not study the impact of the two types of infant day care programs on the incidence of medical abnormalities. However, as we mentioned earlier, the extent to which the day care agencies' health records reflected knowledge of medical problems detected by our study pediatricians was one of the measures used to assess the quality of health care provided to children in the two types of day care programs.

Physical measurements of children's height, weight, and head circumference were obtained during the 6, 12, 18, and 36 month pediatric examinations. The Boston Growth Charts were used to compute percentile height and weight, which take children's age and sex into account. The Nellhaus Growth Chart was used to compute standard measures for head circumference. Unfortunately, the new NCHS growth charts were not available in time for this study.

The 36 month pediatric examination also included vision, auditory, and dental screening of each sample child:

Vision Screening

Vision screenings were performed by project para-professionals who had been trained by a Health Department specialist, and were supervised by project pediatricians during the physical examination.

Distant Snellen and stereopsis (Fly) tests were carried out following standard procedures. Results were reviewed by the study Medical Director, who determined the need for referrals. In accordance with Health Department standards, the following criteria for visual impairment were used:

(1) Visual acuity of 20/50 or less
(2) Discrepancy of one line or more between eyes
(3) Failure to indicate 3-dimensional vision on the stereopsis (Fly) test.

Auditory Screening

Most auditory screenings were performed by project pediatricians who had been trained by Health Department audiologists. The screening consisted of a pure tone sweep test at the 25 decibel level at 1, 2 and 4 Hz. Failure to hear one or more frequencies indicated a possible hearing problem, and the need for further diagnostic testing.

Vision and auditory screening data were particularly difficult to obtain, since the cooperation of the three year old children who were being examined was essential. Such cooperation was often difficult to obtain because of the age of the children. Although we attempted to enlist the cooperation of day care personnel in preparing children for the screening in advance, there were many instances where children were not adequately prepared and could not be trained on the day of testing in the time that was available.

Both vision and hearing problems were coded as medical abnormalities. If the child could not adequately be tested, this was considered missing data.

Dental Screening

Dental screenings were initially performed by Health Department dentists, and these were scheduled independently of the pediatric examinations. The examining dentists determined whether the child had dental problems, and made referrals if necessary. However, there were scheduling problems for the dental screenings. Dental screenings usually required only a few minutes per child. While 2 or 3 pediatric examinations, which required about one hour to perform, could be scheduled in a morning or afternoon session, the dentists considered it unproductive to travel as much as 1½ hours to a day care center to examine a few children. Unfortunately, since the 36 month examination was completed as close to three years of age as possible, and very few children from any one day care program were the correct age during even a period of several months, we were not able to schedule large enough numbers of children for the dentists to see at one location. Transporting children to other centers was clearly not feasible for many reasons. Therefore, we decided to have the dentists train the study pediatricians to perform the dental screenings as part of the 36-month physical examination. Guidelines were established by the Health Department's Bureau of Dentistry for conducting the dental screening examinations and criteria were established for diagnosing dental problems, which were also coded as medical abnormalities.

C. Laboratory Data

Laboratory data consisted of: (1) hematocrit/hemoglobin screening at 6, 12, 18 and 36 months to detect the presence of anemia; (2) hemoglobin electrophoresis once at 12 months or later for sickle cell screening and other hemoglobinopathies; and (3) lead screening at 12, 18, and 36 months.

Blood specimens were obtained at the time of the regularly scheduled physical examinations by project pediatricians and analyzed by the New York City Health Department's Bureau of Laboratories. Microcapillary tests by fingerstick were used initially for hemoglobin and sickle cell tests, whereas venous blood was required for lead tests. Also, at first sickle cell testing was done by Sickledex method by the staff pediatricians. However, when the Bureau of Laboratories revised its testing procedures, it became possible to obtain lead screening (FEP and micro-lead tests), hemoglobin electrophoresis, and hematocrits by micro-methods, eliminating both the need for venous blood and on-site testing.

Laboratory specimens had to be transported from all parts of the city, where the group and family day care centers were located, to a centralized laboratory, where most Health Department laboratory services were provided. This resulted in a relatively large number of both "lost" and "spoiled" specimens (due to hemolysis, etc.) obtained during early pediatric examinations. We were able to obtain laboratory data on a larger proportion of our sample at later ages, once we became aware of the problem and established procedures to minimize the number of lost and spoiled blood samples.

Laboratory reports on sample children were sent to the study Medical Director for coding. Standards for normal and abnormal laboratory tests were established by the Study Medical Committee, in accordance with the following Health Department criteria:

1. Hemoglobin levels:
    - (a) Normal - 11 gms. and over
    - (b) Borderline - less than 11 and more than 10 gms.
    - (c) Low - 10 gms. or less
2. Hematocrit levels:
    - (a) Normal - 33 percent and over
    - (b) Borderline - less than 33 percent and more than 30 percent
    - (c) Low - 30 percent or less
3. Hemoglobin electrophoresis:

    AA, AS, AC, AD, AF, SS, CC, SC, SA

4. Lead Screening

(a) Normal - FEP normal and/or micro-lead less than 0.04
(b) Slightly elevated - micro-lead 0.04 - 0.06
(c) Elevated - micro-lead 0.06 or over

Results

The results of our analyses of the birth history data, medical abnormalities detected during the pediatric examinations, laboratory findings, and physical growth measures were as follows:

Birth History

There were no significant differences among the three 18-month samples in the incidence of low birth weight or birth complications. However, as we reported earlier, there were significant differences among the three 36-month samples in this respect. ($R=.173$, $F_{2,234} = 3.59$, $P \leq .05$) A higher proportion of the Longitudinal Group Day Care children had normal birth histories (i.e. normal birth weight, without complications) than the Longitudinal Family Day Care and Cross-Sectional children, who did not differ greatly in this respect. Sixty-seven percent of the Group Day Care, 49 percent of the Family Day Care, and 49 percent of the Cross-Sectional children had normal birth histories. Since the Longitudinal 18-month group and Family Day Care samples did not differ in this respect, the difference between the two 36-month Longitudinal samples appears to be due to the fact that a higher proportion of Group Day Care children with abnormal birth histories dropped out of the program before three years of age than Family Day Care children.

There were very few children with low birth weight in either the 18-month or 36-month samples: 4 percent of the children in the 18-month sample and 3 percent of the children in the 36-month sample had low birth weights. In regard to the incidence of birth complications, 43 percent of the 18-month sample and 44 percent of the 36-month sample had one or more birth complications. The incidence of low birth weight and birth complications in the 18-month and 36-month samples are presented in Tables 6-3 and 6-4.

Medical Abnormalities

There were no significant differences among the three 18-month or three 36-month samples in the percent of children with medical abnormalities detected during the initial pediatric examination. There were no significant differences among the 18-month samples in this respect on the basis of the 18-month pediatric examination. However, there was a significant difference among the three 36-month samples in the percent of children with medical abnormalities detected during the 36-month pediatric examination. ($Ir^2=.064$, $F_{2,240} = 8.12$, $P \leq .01$). Twenty-five percent of the Group Day Care children, 22 percent of the Family Day Care children, and 50 percent of the Cross-Sectional children manifested medical abnormalities during the 36-month pediatric examination. (See Table 6-6).

However, whereas the Family Day Care children differed significantly in this respect from the Cross-Sectional children ($pr = .254$, $t_{232} = 4.0$, $P \leq .01$), the Group Day Care children did not differ significantly from either the Family Day Care or the Cross-Sectional children in this regard.

The percentages of children in all samples with medical abnormalities detected during the 18 and 36-month pediatric examinations are presented in Table 6-7. The incidence of medical abnormalities at these ages was fairly similar, ranging from 28 to 35 percent. The incidence of minor versus major abnormalities at these ages was also fairly similar at these ages, with approximately 18-20 percent of the children manifesting minor abnormalities, and 10-16 percent manifesting major abnormalities. The incidence of specific minor and major abnormalities detected during the 18 and 36-month pediatric examinations are presented in Tables 6-8 and 6-9. Commonly diagnosed minor abnormalities included umbilical hernia, strabismus, tibial torsion, metatarsus varus, phimosis, and innocent murmur. Most frequently diagnosed major abnormalities included hearing impairment, dental caries, organic heart murmurs and hypertension. In some cases the same type of abnormality can be diagnosed as minor or major, depending on the child's age and the seriousness of the problem. For example, strabismus was judged to be a major abnormality after 18 months of age but a minor abnormality earlier. Dental caries at 36 months may be minor or major depending on how serious or extensive the problem was judged to be.

Laboratory Findings

Hematological assessments consisted of screening for anemia, lead poisoning, and sickle cell disease and other hemoglobinopathies. These findings for 12, 18 and 36 month old children are presented in Tables 6-10, 6-11 and 6-12. As the tables indicate almost all of the children, 95 to 97 percent, at these ages, were normal. Surprisingly, six cases of sickle cell disease were detected, which is fairly high for a sample of this size.

Physical Growth

There were no significant differences initially or at 18 months of age among the three 18-month samples in terms of height and weight. There were significant differences among the three 36-month samples in terms of initial height ($R = .203$, $F_{2,181} = 3.88$, $P \leq .05$) and weight ($R = .302$, $F_{2,180} = 9.01$, $P \leq .01$). Family Day Care children were taller and heavier than Group Day Care children, who in turn were taller and heavier than the Cross-Sectional children. However, whereas the Family and Cross-Sectional children differed significantly in terms of intial height ($pr = .191$, $t_{181} = 2.62$, $P \leq .01$) and weight ($pr = .300$, $t_{180} = 4.22$, $P \leq .01$), the Group Day Care children did not differ significantly in these respects from the Family Day Care or Cross-Sectional children.

At three years of age, the three 36-month samples differed significantly in terms of height ($I_R^2 = .039$, $F_{2,249} = 5.29$, $P \leq .01$) but not in weight. Family Day Care children were taller than the Cross-Sectional children. However, while the Family and Cross-Sectional children differed significantly in this respect ($pr = .205$, $t_{239} = 3.24$, $P \leq .01$), the Group Day Care children did not differ significantly from the Family or Cross-Sectional children in this regard.

Almost all of the head circumference measurements were within the normal range (i.e. within two standard deviations from the mean), and there were no significant initial differences in this respect among the three 18-month or 36-month samples.

The initial physical growth data for the 18 and 36 month samples are presented in Tables 6-13 through 6-18.

Discussion

The three 18-month samples did not differ significantly on any of our physical health or growth measures, either initially or at 18 months of age. The three 36-month samples differed significantly in several respects.

A significantly higher proportion of 36-month Longitudinal Group Day Care children had normal birth histories than Longitudinal Family Day Care or Cross-Sectional children, who did not differ in this respect. Since the 18-month samples did not differ in the incidence of birth problems, the difference among the 36-month samples seems to be due to the fact that more children with birth problems dropped out of Group than Family Day Care between 18 and 36 months of age. It is possible that more children with birth problems were withdrawn from Group than Family Day Care for health reasons, for example, as a result of excessive acute illness. On the other hand, the finding may be fortuitous. Further research is necessary to find out whether the drop-out rates for children with birth problems differ in the two types of day care programs and if so, why?

With the exception of the birth history data, the findings on the 36-month sample, in terms of medical abnormalities and physical growth, followed a similar pattern. There were no significant differences in the incidence of medical abnormalities or physical growth at any time between the Group and Family Day Care children, but the Family Day Care children tended to be healthier and larger than the Cross-Sectional children, who did not differ significantly in these respects from the Group Day Care children. The reason that the Group Day Care children did not differ significantly from the Family Day Care or Cross-Sectional children, who differed significantly, seems to be due to the fact that the Group Day Care children tended to fall between the other two samples on these physical health and growth measures. The important point to keep in mind, however, is that the Group and Family Day Care children did not differ significantly in physical health or growth at any time.

Approximately 40 percent of the children in this study had histories of low birth weight or birth complications. This finding was not unexpected, since all possible abnormalities of pregnancy, delivery, and post-natal course were included. Thus even self-limited and very minor abnormalities in the birth histories were coded. Approximately 3 percent of the children in the study had low birth weights (i.e. below 5 lbs.) which is somewhat less than expected for this population. During 1973 when some of the children in the study were born, 4 percent White, 8 percent Black, and 5 percent Puerto Rican births in New York City were under 5 lbs.[2] In regard to the 40 percent incidence of birth complications of the children in the study, this is somewhat lower than the incidence of 50 percent reported by Pasmanick et al (1956) in their famous Baltimore study on a similar population.

The overall abnormality rates for the children in this study ranged from 28 to 35 percent, which compares favorably with the incidence of medical problems reported for similar children who were not in an infant day care program. Jacobziner et al reported in 1963 that 39 percent of approximately 23,000 preschool children had one or more medical abnormalities on routine physical examination. His population was drawn from Child Health Stations in New York City, which tend to serve low-income families similar to those in the present study. The Cornell Welfare Medical Care Project in 1970 reported that the initial health assessments of their children, from birth to 18 years of age, revealed a 60 percent abnormality rate!

The hematological findings can be summarized briefly. Most children were found to be normal. We found few cases of anemia. In 1968 Lanzkowsky conducted a study of anemia in 417 children, from 6 to 36 months of age, in 40 New York City Child Health Stations. The highest incidence of anemia (hgb of 10 gms. or less) found was at 12 months of age when it was 14 percent. Informal surveys of laboratory reports of hematocrit levels in a single large Child Health Station showed an 8 percent incidence of of anemia in 1973 and again in 1975. The relatively low incidence of 4 percent of anemia cases in our Infant Day Care sample may be due to several factors: (1) the routine use of iron fortified vitamins for infants in Child Health Stations since 1970; and (2) the availability of iron fortified formula and foods to infants and pregnant women under the federally funded WIC program since 1974.

Screening for hemoglobin abnormalities, including sickle cell, revealed an abnormality rate of about 5 percent for the children in our study, which is what one would expect in a sample of children who were about 60 percent Black. A recent evaluation in New York City of newborn screening, which is mandated by law, revealed about a 9 percent incidence of hemoglobin abnormalities in Black infants in 1975-1976.

Lead screening also indicated that relatively few sample children (under 3 percent) had elevated or slightly elevated lead levels.

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[2] Some extrapolation was required, since our 5 lbs. (2250 gm.) cut-off falls between the 2,000-2,500 gm classification traditionally used. We assumed that 2/3 of the births in the group would be 2,250-2,500 gms. and 1/3 would be 2,000-2,250 gms.

Comparable figures from the New York City Health Department's lead screening program of 70,000 children found a 6 percent incidence of elevated lead levels.

In summary, the children in our study sample compared favorably with similar low-income children who were not in an infant day care program in terms of physical health.

Table 6-1

Birth Complications and At-Risk Factors Coded

Mother's Past Obstetrical History

1. Four or more earlier pregnancies
2. Two or more spontaneous abortions
3. Two or more L.B.W. births
4. Other past obstetrical problems

Chronic Illnesses

5. Active Tuberculosis
6. Diabetes Mellitus
7. Seizure disorder
8. Hypertension
9. Heart disease
10. Kidney disease
11. Hemoglobinopathy
12. Emotional illness, on medication
13. Other chronic illness

Current Pregnancy

14. Mother less than 15 or over 40 years
15. Length of pregnancy below 32 weeks (L.B.W. only)
16. Length of pregnancy, 42 weeks or more (N.B.W. only)
17. History of addiction
18. Methadone
19. On potentially hazardous or teratogenic medication
20. Hepatitis
21. Rubella
22. Other viral diseases
23. Late or no prenatal care
24. Inappropriate weight gain
25. Hypertension
26. Proteinuria
27. Anemia
28. Syphilis, treated late
29. Vaginal bleeding (L.D.W. only)
30. Other current pregnancy

Labor

31. Premature rupture of membrane
32. Prolonged labor
33. Short labor

Delivery

34. Midforceps
35. Breech
36. Fetal Distress during delivery
37. Other delivery complication

Child's Condition at Birth

38. Respiratory distress
39. Low apgar
40. Physical measurements deviate from norm
41. Gestational age less than 36 weeks (N.B.W. only)
42. Gestational age, 32 weeks or less (L.B.W. only)
43. Trauma during delivery
44. Gestational age, if known, inappropriate for B.W. (L.B.W. only)

Postnatal condition

45. Respiratory difficulty
46. Seizure
47. Sepsis
48. Bilirubin $>$ 15
49. Hypoglycemia
50. Other Postnatal complication

Table 6-2

LIST OF MEDICAL ABNORMALITIES CODED

I. Endocrine, Metabolic, Nutritional

1. Obesity
2. Malnutrition
3. Other

II. Hematologic by clinical assessment

4. Anemia
5. Other

III. Nervous System & Sense Organs

6. Strabismus
7. Refraction Errors
8. Eye Problems other than
9. Hearing Impairment
10. Malformations of ear(s)
11. Seizure disorder
12. Other

IV. Digestive System

A) Dental

13. Caries
14. Other dental

B) Other than Dental

15. Umbilical hernia
16. Inguinal hernia
17. Other

V. Genitourinary System

18. Anomalies of Female Genitalia
19. Phimosis
20. Hydrocele
21. Cryptorchidism
22. Other Male Genital Disorders

VI. Skin

23. Pigment Anomalies
24. Hemangiomata
25. Dermatitis (chronic)
26. Other

VII. Musculoskeletal System

27. Tibial Torsion
28. Metatarsus Varus
29. Talipes Equinovarus
30. Genu Valgum
31. Other

VIII. Cardiovascular System

32. Innocent Murmurs
33. Organic Murmurs
34. Hypertension
35. Other

IX. Developmental Status by Pediatrician's Assessment

36. Motor Retardation or Lags
37. Mental Retardation
38. Psychomotor Retardation
39. Other

X. Miscellaneous

40. Possible Child Abuse or Neglect
41. Unsatisfactory Growth Increments
42. Cranial Deviations from Norm
43. Congenital Anomalies
44. Other

Table 6-3

Incidence of Low Birth Weight and Birth Complications in Children in Eighteen-Month Sample

SAMPLE	Normal Birth Weight No Complication	Normal Birth Weight With Complication	Low Birth Weight No Complication	Low Birth Weight With Complication
Eighteen-Month Longitudinal Group Day Care Sample	(59) [a] 60.8%	(34) 35.1%	(0) 0.0%	(4) 4.1%
Eighteen-Month Longitudinal Family Day Care Sample	(70) 53.0%	(59) 44.7%	(0) 0.0%	(3) 2.3%
Eighteen-Month Cross-Sectional Sample	(38) 59.4%	(22) 34.4%	(1) 1.6%	(3) 4.7%
TOTAL	(167) 57.0%	(115) 39.2%	(1) 0.3%	(10) 3.4%

N = 293

Table 6-4

Incidence of Low Birth Weight and Birth Complications in Children in Thirty-Six Month Sample

SAMPLE	Normal Birth Weight No Complication	Normal Birth Weight With Complication	Low Birth Weight No Complication	Low Birth Weight With Complication
Thirty-Sic Month Longitudinal Group Day Care Sample	(55)[a] 67.1%	(24) 29.3%	(0) 0.0%	(3) 3.7%
Thirty-Six Month Longitudinal Family Day Care Sample	(44) 48.9%	(43) 47.8%	(1) 1.1%	(2) 2.2%
Thirty-Six Month Cross-Sectional Sample	(32) 49.2%	(31) 47.7%	(0) 0.0%	(2) 3.1%
TOTAL	(131) 55.3%	(98) 41.4%	(1) 0.4%	(7) 3.0%

N = 237

Table 6-5

Incidence of Initial Medical Abnormalities in Children in the Eighteen Month Sample

SAMPLE	Medical Abnormalities None	 Minor	 Significant	
Eighteen-Month Longitudinal Group Day Care Sample	(38) 60.3%	(16) 25.4%	(9) 14.3%	
Eighteen-Month Longitudinal Family Day Care	(48) 64.0%	(20) 26.7%	(7) 9.4%	
Eighteen-Month Cross-Sectional	(47) 73.4%	(8) 12.5%	(9) 14.1%	
TOTAL	(133) 65.8%	(44) 21.8%	(25) 12.4%	N = 202

Incidence of Medical Abnormalities in Children at Eighteen-Months of Age

SAMPLE	Medical Abnormalities None	 Minor	 Significant	
Eighteen-Month Longitudinal Group Day Care Sample	(75) 75.8%	(14) 14.3%	(10) 10.1%	
Eighteen-Month Longitudinal Family Day Care	(88) 68.7%	(29) 22.6%	(11) 8.6%	
Eighteen-Month Cross-Sectional	(47) 73.3%	(8) 12.5%	(9) 14.1%	
TOTAL	(210) 72.1%	(51) 17.5%	(30) 10.4%	N = 291

Table 6-6

Incidence of Initial Medical Abnormalities in Children in the Thirty-Six Month Sample

	Medical Abnormalities			
SAMPLE	None	Minor	Significant	
Thirty-Six Month Longitudinal Group Day Care	(35) 64.8%	(7) 13.0%	(12) 22/2%	
Thirty-Six Month Longitudinal Family Day Care	(33) 60.0%	(15) 27.3%	(7) 12.7%	
Thirty-Six Month Cross-Sectional Sample	(37) 50.0%	(19) 25.7%	(18) 24.3%	
TOTAL	(105) 57.4%	(41) 22.4%	(37) 20.2%	N = 183

Incidence of Medical Abnormalities in Children at Thirty-Six Month of Age

	Medical Abnormalities		
SAMPLE	None	Minor	Significant
Thirty-Six Month Longitudinal Group Day Care	(51) [a] 64.6%	(20) 25.3%	(8) 10.1%
Thirty-Six Month Longitudinal Family Day Care	(70) 77.8%	(8) 8.9%	(12) 13.3%
Thirty-Six Month Cross-Sectional Sample	(37) 50	(47) 25.7%	(18) 24.3%
TOTAL	(158) 65.0%	(47) 19.3%	(38) 15.7%

Table 6-7

Percentage of Children with Medical Abnormalities Detected During 12, 18 and 36 Month Pediatric Examinations

	MEDICAL ABNORMALITIES		
AGE	Normal	Minor	Significant
12 Months	(121) 66.9%	(37) 20.4%	(23) 12.7% N = 181
18 Months	(210) 72.1%	(51) 17.6%	(30) 10.3% N = 291
36 Months	(158) 65.0%	(47) 19.3%	(38) 15.7% N = 243

Table 6-8

Incidence of Specific Major Medical Abnormalities Detected During Eighteen and Thirty-Six Month Pediatric Examinations

MAJOR ABNORMALITIES	18 Months		36 months	
	Freq.	%	Freq.	%
1. Obesity			1	2.3
2. Malnutrition	1	3.3	1	2.3
3. Other Endocrine, Metabolic, or Nutritional Disorder	1	3.3	1	2.3
4. Anemia	1	3.3	1	2.3
5. Other Hematologic Disorder				
6. Strabismus	8	26.7	3	7.0
7. Refractive Errors			1	2.3
8. Eye Problems other than	4	13.4		
9. Hearing Impairment			14	32.6
10. Malformations of ear(s)				
11. Seizure disorder				
12. Other Nervous System or Sense Organ Disorder				
13. Caries			3	7.0
14. Other dental			1	2.3
15. Umbilical hernia			2	4.7
16. Inguinal hernia			1	2.3
17. Other than Dental				
18. Anomalies of Female Genitalia				
19. Phimosis			1	2.3
20. Hydrocele				
21. Cryptorchidism				
22. Other Male Genital Disorders				
23. Pigment Anomalies				
24. Hemangiomata				
25. Dermatitis (chronic)				
26. Other Skin Disorder			1	2.3
27. Tibial Torsion	5	16.7		
28. Metatarsus Varus				
29. Talipes Equinovarus				
30. Genu Valgum				
31. Other Musculoskeletal Disorder				
32. Innocent Murmurs				
33. Organic Murmurs	2	6.7	2	4.7
34. Hypertension			2	4.7
35. Other Cardiovascular Disorder				
36. Motor Retardation or Lags				
37. Mental Retardation	1	3.3	1	2.3
38. Psychomotor Retardation	1	3.3	1	2.3
39. Other Developmental Disorder			1	2.3
40. Possible Child Abuse or Neglect	3	10.0	1	2.3
41. Unsatisfactory Growth Increments				
42. Cranial Deviations from Norm	1	3.3		
43. Congenital Anomalies				
44. Other	2	6.7	3	7.0

Table 6-9

Incidence of Specific Minor Medical Abnormalities Detected During Eighteen and Thirty-Six Month Pediatric Examinations

MINOR ABNORMALITIES	18 Months		36 Months	
	Freq.	%	Freq.	%
1. Obesity	5	7.2	2	2.9
2. Malnutrition	2	2.9	1	1.5
3. Other Endocrine, Metabolic, or Nutritional Disorder			1	1.5
4. Anemia			1	1.5
5. Other Hematologic Disorder				
6. Strabismus	1	1.5	1	1.5
7. Refractive Errors			2	2.9
8. Eye Problems other than				
9. Hearing Impairment				
10. Malformations of ear(s)				
11. Seizure Disorder				
12. Other Nervous System or Sense Organ Disorder				
13. Caries			6	8.8
14. Other dental			3	4.4
15. Umbilical hernia	8	11.6	7	10.3
16. Inguinal hernia				
17. Other than Dental				
18. Anomalies of Female Genitalia				
19. Phimosis	7	10.1	1	1.5
20. Hydrocele				
21. Cryptorchidism	1	1.5		
22. Other Male Genital Disorders				
23. Pigment Anomalies	2	2.9		
24. Hemangiomata	6	8.7	2	2.9
25. Dermatitis (chronic)	1	1.5	5	7.3
26. Other Skin Disorder	4	5.8	6	8.8
27. Tibial Torsion	10	14.5	1	1.5
28. Metatarsus Varus	5	7.2	3	4.4
29. Talipes Equinovarus				
30. Genu Valgum			2	2.9
31. Other Musculoskeletal Disorder	2	2.9	3	4.4
32. Innocent Murmurs	9	13.0	11	16.2
33. Organic Murmurs				
34. Hypertension				
35. Other Cardiovascular Disorder			1	1.5
36. Motor Retardation or Lags				
37. Mental Retardation				
38. Psychomotor Retardation				
39. Other Developmental Disorder			1	1.5
40. Possible Child Abuse or Neglect				
41. Unsatisfactory Growth Increments	1	1.5	1	1.5
42. Cranial Devations from Norm	1	1.5	2	2.9
43. Congenital Anomalies	4	5.8	2	2.9
44. Other			3	4.4

Table 6-10

Incidence of Anemia at 12, 18 and 36 Months of Age

AGE	HEMATOCRIT/HEMOGLOBIN LEVELS Normal	 Borderline	 Low	
12 Months	(102) 97.1%	(2) 1.9%	(1) 1.0%	N = 105
18 Months	(192) 97.0%	(4) 2.0%	(2) 1.0%	N = 198
36 Months	(189) 96.4%	(5) 2.6%	(2) 1.0%	N = 196

Table 6-11

Incidence of Abnormal Lead Levels at 12, 18 and 36 Months of Age

	LEAD LEVELS			
Age	Negative	Slightly Elevated	Definitely Elevated	
12 Months	(152) a 97.4%	(4) 2.6%	(0) 0.0%	N = 156
18 Months	(245) 97.6%	(5) 2.0%	(1) 0.4%	N = 251
36 Months	(196) 99.5%	(1) 0.5%	(0) 0.0%	N = 197

Table 6-12

Results of Screening for Sickle Cell and other Hemoglobinopathies at 12, 18 and 36 Months of Age

AGE	ELECTROPHORESIS FINDINGS									
	Normal	Trait	Disease	AC	AD	AF	CC	SC	SA	
12 Months	(144) 93.6%	(7) 4.6%	(1) 0.6%	(1) 0.6%	(0) 0%	(1) 0.6%	(0) 0%	(0) 0%	(0) 0%	N = 154
18 Months	(232) 93.6%	(12) 4.8%	(0) 0%	(2) 0.8%	(1) 0.9%	(1) 0.9%	(0) 0%	(0) 0%	(0) 0%	N = 248
36 Months	(198) 91.2%	(12) 5.6%	(5) 2.3%	(0) 0%	(0) 0%	(2) 0.9%	(0) 0%	(0) 0%	(0) 0%	N = 216

Table 6-13

Initial Percentile Height[a] of Children in Eighteen-Month Sample

					PERCENTILE HEIGHTS				
SAMPLE	<3d	3d-10th	10th 25th	25th-50th	50th-75th	75th-90th	90th-97th	>97th	
Eighteen-Month Longitudinal Group Day Care Sample	(7) 12.1%	(3) 5.2%	(5) 8.6%	(10) 17.2%	(13) 22.4%	(11) 19.0%	(4) 6.9%	(5) 8.6%	
Eighteen-Month Longitudinal Family Day Care Sample	(7) 9.6%	(2) 2.7%	(11) 15.1%	(14) 19.2%	(13) 17.8%	(7) 9.6%	(10) 13.7%	(9) 12.3%	
Eighteen-Month Cross-Sectional Sample	(3) 4.8%	(6) 9.7%	(8) 12.9%	(13) 21.0%	(11) 17.7%	(10) 16.1%	(10) 16.1%	(1) 1.6%	
TOTAL	(17) 8.8%	(11) 5.7%	(24) 12.4%	(37) 19.2%	(37) 19.2%	(28) 14.5%	(24) 12.4%	(15) 7.8%	N = 193

Percentile Height of Children at Eighteen-Months

					PERCENTILE HEIGHTS				
SAMPLE	<3d	3d-10th	10th 25th	25th 50th	50th 75th	75th 90th	90th 97th	>97th	
Eighteen-Month Longitudinal Group Day Care Sample	(10) 10.5%	(6) 6.3%	(19) 20.0%	(26) 27.4%	(14) 14.7%	(5) 5.3%	(14) 14.7%	(1) 1.1%	
Eighteen-Month Longitudinal Family Day Care Sample	(10) 7.9%	(9) 7.1%	(24) 18.9%	(29) 22.8%	(22) 17.3%	(17) 13.4%	(12) 9.4%	(4) 3.1%	
Eighteen-Month Cross-Sectional Sample	(3) 4.8%	(6) 9.7%	(8) 12.9%	(13) 21.0%	(11) 17.7%	(10) 16.1%	(10) 16.1%	(1) 1.6%	
TOTAL	(22) 7.7%	(21) 7.4%	(51) 18.0%	(68) 23.9%	(47) 16.5%	(32) 11.3%	(36) 12.7%	(6) 2.1%	N = 284

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a. Based on Boston Growth Charts.

Table 6-14

Initial Percentile[a] Height of Children in Thirty-Six Month Sample

SAMPLE	PERCENTILE HEIGHTS <3d	3d-10th	10th-25th	25th-50th	50th-75th	75th-90th	90th-97th	>97th	
Thirty-Six Month Longitudinal Group Day Care Sample	(4) 7.5%	(3) 5.7%	(6) 11.3%	(11) 20.8%	(12) 22.6%	(8) 15.1%	(7) 13.2%	(2) 3.8%	
Thirty-Six Month Longitudinal Family Day Care Sample	(4) 7.4%	(0) 0.0%	(8) 14.8%	(14) 25.9%	(8) 14.8%	(7) 13.0%	(8) 14.8%	(5) 9.3%	
Thirty-Six Month Cross-Sectional Sample	(8) 10.4%	(12) 15.6%	(12) 15.6%	(15) 19.5%	(15) 19.5%	(5) 6.5%	(7) 9.1%	(3) 3.9%	
TOTAL	(16) 8.7%	(15) 8.2%	(26) 14.1%	(40) 21.7%	(35) 19.0%	(20) 10.9%	(22) 12.0%	(10) 5.4%	N = 184

Percentile[a] Height of Children at Thirty-Six Months

SAMPLE	PERCENTILE HEIGHTS <3d	3d-10th	10th-25th	25th-50th	50th-75th	75th-90th	90th-97th	>97th	
Thirty-Six Month Longitudinal Group Day Care Sample	(3) 3.7%	(3) 3.7%	(14) 17.1%	(20) 24.4%	(20) 24.4%	(15) 18.3%	(4) 4.9%	(3) 3.7%	
Thirty-Six Month Longitudinal Family Day Care Sample	(1) 1.1%	(2) 2.2%	(12) 13.5%	(20) 22.5%	(30) 33.7%	(14) 15.7%	(6) 6.7%	(4) 4.5%	
Thirty-Six Month Cross-Sectional Sample	(8) 10.4%	(12) 15.6%	(12) 15.6%	(15) 19.5%	(15) 19.5%	(5) 6.5%	(7) 9.1%	(3) 3.9%	
TOTAL	(12) 4.8%	(17) 6.9%	(38) 15.3%	(55) 22.2%	(65) 26.2%	(34) 13.7%	(17) 6.9%	(10) 4.0%	N = 248

a. Based on Boston Growth Charts.

Table 6-15

Initial Percentile[a] Weight of Children in Eighteen-Month Sample

	PERCENTILE WEIGHTS								
SAMPLE	<3d	3d-10th	10th-25th	25th-50th	50th-75th	75th-90th	90th-97th	>97th	
Eighteen-Month Longitudinal Group Day Care Sample	(1) 1.7%	(6) 10.3%	(9) 15.5%	(7) 12.1%	(13) 22.4%	(15) 25.9%	(4) 6.9%	(3) 5.2%	
Eighteen-Month Longitudinal Family Day Care Sample	(1) 1.4%	(6) 8.3%	(6) 8.3%	(12) 16.7%	(21) 29.2%	(11) 15.3%	(9) 12.5%	(6) 8.3%	
Eighteen-Month Cross-Sectional Sample	(2) 3.2%	(4) 6.5%	(10) 16.1%	(20) 32.3%	(7) 11.3%	(8) 12.9%	(9) 14.5%	(2) 3.2%	
TOTAL	(4) 2.1%	(16) 8.3%	(25) 13.0%	(39) 20.3%	(41) 21.4%	(34) 17.7%	(22) 11.5%	(11) 5.7%	N = 192

Percentile[a] Weight of Children in Eighteen-Month Sample

	PERCENTILE WEIGHTS								
SAMPLE	<3d	3d-10th	10th-25th	25th-50th	50th-75th	75th-90th	90th-97th	>97th	
Eighteen-Month Longitudinal Group Day Care Sample	(2) 2.2%	(9) 9.4%	(15) 15.6%	(23) 24.0%	(22) 22.9%	(14) 14.6%	(8) 8.3%	(3) 3.1%	
Eighteen-Month Longitudinal Family Day Care Sample	(2) 1.6%	(11) 8.7%	(19) 15.0%	(28) 22.0%	(29) 22.8%	(24) 18.9%	(11) 8.7%	(3) 2.4%	
Eighteen-Month Cross-Sectional Sample	(2) 3.2%	(4) 6.5%	(10) 16.1%	(20) 32.3%	(7) 11.3%	(8) 12.9%	(9) 14.5%	(2) 3.2%	
TOTAL	(5) 1.8%	(24) 8.4%	(44) 15.4%	(71) 24.9%	(58) 20.4%	(46) 16.1%	(28) 9.8%	(8) 2.8%	N = 284

[a] Based on Boston Growth Charts.

Table 6-16

Initial Percentile[a] Weight of Children in Thirty-Six Month Sample

PERCENTILE WEIGHTS

SAMPLE	<3d	3rd-10th	10th-25th	25th-50th	50th-75th	75th-90th	90th-97th	>97th	
Thirty-Six Month Longitudinal Group Day Care Sample	(1) 1.9%	(4) 7.5%	(10) 18.9%	(13) 24.5%	(10) 18.9%	(10) 18.9%	(4) 7.5%	(1) 1.9%	
Thirty-Six Month Longitudinal Family Day Care Sample	(0) 0.0%	(3) 5.6%	(4) 7.4%	(9) 16.7%	(12) 22.2%	(11) 20.4%	(10) 18.5%	(5) 9.3%	
Thirty-Six Month Cross-Sectional Sample	(8) 10.5%	(11) 14.5%	(9) 11.8%	(20) 26.3%	(12) 15.8%	(7) 9.2%	(3) 3.9%	(6) 7.9%	
TOTAL	(9) 4.9%	(18) 9.8%	(23) 12.6%	(42) 23.0%	(34) 18.6%	(28) 15.3%	(17) 9.3%	(12) 6.6%	N = 183

Percentile[a] Weight of Children at Thirty-Six Months

PERCENTILE WEIGHTS

SAMPLE	<3d	3d-10th	10th-25th	25th-50th	50th-75th	75th-90th	90th-97th	>97th	
Thirty-Six Month Longitudinal Group Day Care Sample	(2) 2.6%	(5) 6.4%	(11) 14.1%	(23) 29.5%	(12) 15.4%	(11) 14.1%	(9) 11.5%	(5) 6.4%	
Thirty-Six Month Longitudinal Family Day Care Sample	(2) 2.5%	(4) 5.0%	(8) 10.0%	(20) 25.0%	(21) 26.3%	(12) 15.0%	(8) 10.0%	(5) 6.3%	
Thirty-Six Month Cross-Sectional Sample	(8) 10.5%	(11) 14.5%	(9) 11.8%	(20) 26.3%	(12) 15.8%	(7) 9.2%	(3) 3.9%	(6) 7.9%	
TOTAL	(12) 5.1%	(20) 8.5%	(28) 12.0%	(63) 26.9%	(45) 19.2%	(30) 12.8%	(20) 8.5%	(16) 6.8%	N = 234

a. Based on Boston Growth Charts

Table 6-17

Initial Head Circumference[a] of Children in Eighteen-Month Sample

SAMPLE	HEAD CIRCUMFERENCE Small Less than 2 Standard Deviations (2.5%)[b]	Normal (95%)	Large Greater than 2 Standard Deviations (2.5%)
Eighteen-Month Longitudinal Group Day Care Sample	(0) 0.0%	(58) 98.3%	(1) 1.7%
Eighteen-Month Longitudinal Family Day Care Sample	(1) 1.4%	(69) 94.5%	(3) 4.1%
Eighteen-Month Cross-Sectional Sample	(3) 4.8%	(57) 90.5%	(3) 4.8%
TOTAL	(4) 2.1%	(184) 94.4%	(7) 3.6% N = 195

Head Circumference[a] of Children at Eighteen-Months

SAMPLE	HEAD CIRCUMFERENCE Small Less than 2 Standard Deviations (2.5)[b]	Normal (95%)	Large Greater than 2 Standard Deviations (2.5%)
Eighteen-Month Longitudinal Group Day Care Sample	(0) 0.0%	(97) 99.0%	(1) 1.0%
Eighteen-Month Longitudinal Family Day Care Sample	(2) 1.6%	(117) 92.9%	(7) 5.6%
Eighteen-Month Cross-Sectional Sample	(3) 4.8%	(57) 90.5%	(3) 4.8%
TOTAL	(5) 1.7%	(271) 94.4%	(10) 3.5% N = 287

[a] Based on Nellhaus Growth Charts

[b] Percentage of standardization in sample.

Table 6-18

Initial Head Circumference[a] of Children in Thirty-Six Month Sample

SAMPLE	HEAD CIRCUMFERENCE Large Greater than 2 Standard Deviations (2.5%)[b]	Normal (95%)	Small Less than 2 Standard Deviations (2.5%)
Thirty-six Month Longitudinal Group Day Care Sample	(3) 5.6%	(50) 92.6%	(1) 1.9%
Thirty-six Month Longitudinal Family Day Care Sample	(1) 1.9%	(50) 94.3%	(2) 3.8%
Thirty-Six Month Cross-Sectional Sample	(0) 0.0%	(74) 100.0%	(0) 0.0%
TOTAL	(4) 2.2%	(174) 96.1%	(3) 1.7%

N = 181

Head Circumference[a] of Children at Thirty-Six Months

SAMPLE	HEAD CIRCUMFERENCE Large Greater than 2 Standard Deviations (2.5%)[b]	Normal (95%)	Small Less than 2 Standard Deviations (2.5%)
Thirty-Six Month Longitudinal Group Day Care Sample	(1) 1.2%	(79) 96.3%	(2) 2.4%
Thirty-six Month Longitudinal Family Day Care Sample	(3) 3.5%	(83) 96.5%	(0) 0.0%
Thirty-six Month Cross-Sectional Sample	(0) 0.0%	(74) 100.0%	(0) 0.0%
TOTAL	(4) 1.7%	(236) 97.5%	(2) 0.8%

N = 242

a. Based on Nellhaus Growth Charts.

b. Percentage of standardization in sample.

CHAPTER 7 - COMPARISON OF THE NUTRITION PROVIDED TO INFANTS IN GROUP AND FAMILY DAY CARE

For many of the babies from low-income families in infant day care programs, the noon meal and snacks provided to them in their day care setting may be an important source of daily nutriment. To what extent did the Group and Family day care programs differ in the nutrition they provided to babies?

There are differences in the organizational structure of the Group and Family infant day care programs in the study which could affect the nutritional aspects of these programs. In Group Day Care, the nutritional content of the food provided to children in the center is supervised by the New York City Health Department, which also licenses group centers in the city. Group Day Care centers are required to submit menus to the Health Department regularly, and these are reviewed for their nutritional value. On-site inspections of day care centers are made at licensing time to insure that the Health Code is followed. This includes an inspection of kitchen facilities to make sure they are sanitary and hazard-free.

The Family Day Care programs, on the other hand, are neither licensed nor supervised by the New York City Health Department, so that the nutritional aspects of the Family Day Care programs are not regulated by the New York City Health Code; nor is there any on-site inspection in Family Day Care homes by the Health Department. The New York State Department of Social Services, which regulates the licensing of Family Day Care homes, requires only that a hot meal and two snacks be provided to children under full-time day care. Provider-mothers may have been given nutritional information as part of their training. However, such nutritional training may have been sporadic, and the extent to which such knowledge was actually put into practice depended upon the provider-mother, as well as the Education Aides who made twice-weekly visits to each Family Day Care home.

One of the major purposes of the study was to find out whether such differences in the two types of infant day care programs made a difference in the nutritional value of the food provided to babies in their day care setting. We were also interested in determining the extent to which differences in the nutrition provided to infants in their day care setting, regardless of type of day care program, contributed to differences in their later physical growth.

Method

In order to obtain data on these issues, our Field Team Observers made systematic, naturalistic all-day observations of each sample child in his or her usual day care setting at 12, 18 and 24 months of age. Using the Food Record,[1] the Observers coded the types of food presented to the sample child during the noon meal and snacks. Only those foods which were offered and ingested by the child were counted. (Copies of the Food Record were submitted to our funding agencies in Appendix H of the June 30, 1973 Progress Report).

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[1] The methods for obtaining and coding nutritional data in this study were developed by Ms Catherine Cowell, Director of the New York City Health Department's Bureau of Nutrition.

The nutritional data which we collected was limited in two important respects: (1) We decided that it would be impractical to assess the amount or quantity of food actually consumed by the child. On the other hand, we found that our Observers could reliably code the types or categories of food presented and not refused by the child. Therefore, we assessed the nutritional value of the type of food ingested by children, but not the amount or quantity they actually consumed. (2) It is also important to keep in mind that we evaluated only the diet provided to children in their day care setting. This did not take into account children's complete daily nutritional intake, some of which, of course, they received at home.

On the basis of the data obtained from the Food Record, we computed a Positive, Negative, and Total Nutrition score for each sample child at 12, 18 and 24 months of age.

The Positive Nutrition score was computed on the basis of 10 food categories (e.g. grains, vegetables, milk, etc.) which were considered by our nutrition cobsultant to have positive nutritional value for children of this age. Each food category was assigned a weight of +1 or +2, depending upon its importance to a baby's diet. If a child consumed no food from a particular category, a score of 0 was given for that category. If the child consumed food from the same category (e.g. milk) at different times during the day, credit was given each time. The frequencies of the 10 food categories were generally 0 or 1, and rarely exceeded 2. The child's Positive Nutrition score was based on the sum of the weighted scores, with higher scores reflecting better nutrition.

The Negative Nutrition score was computed on the basis of six food categories which were considered to be "empty calorie foods" or foods unsuitable for children of this age. These included soft drinks, potato chips, fried foods, luncheon meats, coffee, raisins, nuts, etc. Each of the six negative food categories were assigned a weight of -1 or -2, depending upon how detrimental it was considered for children of this age. The child's Negative Nutrition score was based on the sum of the weighted scores, with higher scores reflecting poorer nutrition.

The Total Nutrition score was computed by subtracting the Negative from the Positive score. In addition to computing Positive, Negative, and Total Nutrition scores for each child on the basis of the whole day's observations, we computed separate Total Noon Meal and Total Snack scores. The lists of Positive and Negative food categories, and the weights assigned to each category, are presented in Tables 7-1 and 7-2.

In analyzing the data, first we wanted to find out whether the group and family day care programs differed in the nutrition provided to babies at 12, 18 and 24 months of age. Separate cross-sectional comparisons were made between the two types of infant day care programs on the all-day Positive, Negative, and Total Nutrition scores, as well as on the Total Noon Meal and Total Snack scores at each of these ages.

Secondly, we wanted to determine the extent to which differences in the nutrition provided to infants in their day care setting contributed to later differences in children's physical growth. Since height and weight are commonly used to assess the adequacy of children's nutrition (Christakis, 1973), we computed correlations between our nutrition measures and height and weight at 18 and 36 months of age. In a recent study, Talwar (1973) reported that height and weight combined may be a more sensitive measure of nutritional adequacy than either of the two growth measures separately. Therefore, we also computed correlations between the nutrition measures and height and weight combined at 18 and 36 months of age.

Children's height and weight were measured during the 6, 12, 18 and 36 month pediatric examinations. The two growth measures were converted to percentiles, using the Boston Growth Charts, which take the child's age and sex into account. Children were assigned to one of the following eight percentile groups for height and weight separately: (1) <3rd percentile; (2) 3rd-10th; (3) 10-25th; (4) 25-50th; (5) 50-75th; (6) 75-90th; (7) 90-97th; and (8) >97th percentile. For data analytic purposes, each child was assigned a score of 1 to 8 for each growth measure, with higher scores reflecting relatively greater height or weight.

We computed correlations between the nutrition scores at 12 and 18 months separately with height and weight at 18 months of age; correlations were also computed between the nutrition scores at 12, 18 and 24 months of age separately and the two growth measures at 36 months of age.

In addition, we computed correlations between the nutrition scores and height and weight combined. This was done in two ways:

(a) Children were assigned to one of the following three height/weight categories: (1) Underweight, if weight was more than two percentile groups (i.e. more than two standard deviations) less than height; (2) Normal-Weight, if weight was within two percentile groups of height, and (3) Over-weight, if weight was more than two percentile groups greater than height.

(b) Since there were so few underweight or overweight children, we combined the two extreme groups and assigned children to one of the following two height/weight categories: (1) Normal-Weight; and (2) Abnormal-Weight, which included both underweight and overweight children.

Results

The results of our statistical analyses on the nutrition measures can be stated simply. On most of these measures, there were highly significant differences favoring Group over Family day care at all ages. The results are summarized in Table 7-3.

Children in Group Day Care obtained significantly higher Total Nutrition, Positive and Total Noon Meal scores than the Family Day Care children at 12, 18 and 24 months of age. Children in Family Day Care obtained significantly higher Negative Nutrition scores than Group Day Care children at 18 and 24 months, but not at 12 months of age. There were no signficant differences between the two types of day care programs in the nutritional value of the Snacks provided to children at any age.

We also computed correlations between the Total Nutrition, Positive and Negative Nutrition scores and the physical growth measures at 18 and 36 months of age. These results can also be stated simply. None of the three nutrition measures at any age correlated signficantly with any of the growth measures at 18 or 36 months of age.

Discussion

In comparing the nutrition provided to babies in their Group and Family day care settings at 12, 18 and 24 months of age, we found that, in general, children in Group Day Care were provided with more positive nutritional foods than those in Family Day Care; whereas children in Family Day Care were provided with more negative nutritional foods than those in Group Day Care. There may be several explanations for these findings.

To a large extent these differences may stem from the structural differences in the two types of infant day care programs mentioned earlier. In Group Day Care it is much easier to control the type of food provided to children, since this decision is made by only a few people in the center, particularly the Director, in consultation with nutrition specialists from the New York City Health Department. In discussing these results at a Policy Committee meeting, we were informed that in most licensed public day care centers certain types of "junk foods" (such as soft drinks, potato chips, etc.) are simply not served.

On the other hand, it is much more difficult for the Director of a family day care agency to control the food that is served to children by provider-mothers in Family Day Care homes. Whereas a Group Day Care Director knows what food is served to the children in her center every day, this is clearly impossible for the Director of a Family Day Care program. In Family Day Care, the food provided to children on a day-to-day basis is largely determined by the individual provider-mothers, who may or may not follow the nutritional guidance they receive from their family day care agency. Whereas there were only 11 Group Infant Day Care programs in the study, more than 100 Family Day Care homes, affiliated with 20 Family Day Care agencies, participated in the study. The food which provider-mothers give to children under their care is probably the same food they give to their own children.

When the study first began, a common complaint voiced by Family Day Care Directors and provider-mothers was that the food allowance for children under their care was inadequate. Initially somewhat more money may have been spent on food for Group Day Care children than Family Day Care children, although this was not the case later in the study. The earlier differences in food allowances for children in the two types of infant day care programs may have contributed to the differences we found in the positive nutritional value of the food provided to babies. However, this would not explain why children in Family Day Care were given more "junk food", which is often costly, than children in Group Day Care.

While it may be important to increase food allowances for children in both types of day care programs, members of the Policy Committee from both programs in the study agreed that money alone will not solve the problem. The Policy Committee members felt that the key to improving the nutrition provided to children in infant day care programs, and particularly Family Day Care,is greater nutritional education for the people who select and prepare the food served to children in these programs.

While the nutrition measures we used detected consistent signficant differences in the nutritional value of the food provided to babies in the two types of infant day care programs, favoring Group over Family Day Care, they were not related to children's later physical growth, which was not an unexpected finding. Other studies also fail to find such relationships. As we said earlier, the present study was limited in two important respects: (1) While we assessed the nutritional value of the kinds of food provided to infants in their Group Day Care setting, our measures did not include the actual amount of food consumed by children (i.e. caloric intake), which of course would make a great deal of difference to children's physical growth; (2) secondly, we did not include the food children were provided at home, which was an important source of daily nutriment that also contributed to children's later physical growth. While the qualitative differences in the nutritional value of food provided to infants in their day care setting were not related to children's later physical growth, the kinds of food given to children may affect other aspects of their later phsyical health which the study was not designed to measure.

Table 7-1

Food Categories and Weights Used to Compute Positive Nutrition Scores

FOOD CATEGORIES	WEIGHT	DESCRIPTION
1. Milk or Formula	+2	Includes both whole and skimmed milk
2. Milk Products	+1	Includes cheese (except cream cheese), ice creas, milk puddings, and custards.
3. Protein Foods	+2	Includes meat and meat products (except luncheon meats), eggs, fish, dried peas and beans. (While whole milk and cheese are also good sources of proteins, they were included in separate categories.)
4. Grain and Grain Products	+2	Includes bread, rolls, crackers, rice and rice products, cereals, and pastas.
5. Vitamin A Rich Foods	+2	Includes leafy green and deep yellow vegetables and fruits, such as spinach, collard greens, broccoli, carrots, yellow squash, mango, cantaloupe, etc.
6. Vitamin C Rich Foods	+2	Includes citrus fruits and juices, tomatoes, strawberries, etc.
7. Vegetables (not rich in A or C)	+1	Includes lettuce, green peas, string beans, cucumbers, corn, potatoes, plaintain, yautia, etc.
8. Fruits (not rich in A or C)	+1	Includes apples, pears, cherries, grapes, watermelon, etc.
9. Desserts	+2	Includes nutritious desserts, such as plain cake, cookies (e.g., peanut butter, raisin, oatmeal cookies, etc.) Excludes sugary cakes and cookies.
10. Soups	+1	Includes chicken, vegetables, Noodle soup, etc.

Table 7-2

Food Categories and Weights Used to Compute Negative Nutrition Scores

FOOD CATEGORIES	WEIGHTS	DESCRIPTION
1. Combination Dinner	1	Includes packaged baby-food dinners, such as Hi-Meat, Hi-Protein dinners, etc. which are usually followed by the initial of a baby food brand, "Asopao" which is not followed by a brand initial, is also included.
2. Solid empty calorie foods	2	Includes sugary cakes and cookies, sugars and syrups, jams and jellies, donuts and pasteries, candy, potato chips, and similar popular snack-type foods.
3. Liquid empty calorie foods	2	Includes soft drinks, fruits drinks, punches, ades, beer, malt, etc.
4. Baby food desserts high in sugar	2	Includes blue-berry buckle, tutti-fruitti, fruit cobblers, etc.
5. Unsuitable foods for babies	2	Includes foods which may have nutritional value, but are considered unsuitable for infants, such as coffee and tea, alcoholic beverages, fried foods, cream cheese, bacon, raisins, nuts, pickles, highly seasoned food (e.g., luncheon meats, hot dogs, etc.)
6. Foods added to bottle	2	Includes any food added to bottle, such as cereal, sugar, etc.

Table 7-3

Comparison of Mean Nutrition Index Scores[a] of Group and Family Day Care Children at 12, 18 and 24 Months of Age

Mean Nutrition Index Scores at 12 Months

TYPE OF DAY CARE PROGRAM	N	Total Noon Meal	Total Snacks	All Day Positive	All Day Negative	All Day Total
Group Day Care	75	5.31*	1.84	7.84*	-1.43	6.42*
Family Day Care	101	3.12	2.26	6.33	-1.68	4.65

Mean Nutrition Index Scores at 18 Months

TYPE OF DAY CARE PROGRAM	N	Total Noon Meal	Total Snacks	All Day Positive	All Day Negative	All Day Total
Group Day Care	126	7.38*	1.70	9.53*	-1.18	9.08*
Family Day Care	159	4.14	2.14	7.37	-1.81	6.29

Mean Nutrition Index Scores at 24 Months

TYPE OF DAY CARE PROGRAM	N	Total Noon Meal	Total Snacks	All Day Positive	All Day Negative	All Day Total
Group Day Care	100	8.84*	1.82	12.36*	-1.70	10.66*
Family Day Care	115	4.60	1.46	8.50	-2.44*	6.05

a. Total Noon Meal = Positive Minus Negative Noon Meal Scores
Total Snacks = Positive Minus Negative Snack Scores
All Day Positive = Positive Noon Meal Plus Positive Snack Scores
All Day Negative = Negative Noon Meal Plus Negative Snack Scores
All Day Total = All Day Positive Minus All Day Negative Scores

* Signficant difference between Group and Family Day Care, $P \leq .01$

Table 7-4

Percent of Underweight, Normal Weight and Overweight Children in the Eighteen Month Sample

	WEIGHT FOR HEIGHT					
	Initial			At 18 Months		
SAMPLE	Under Weight	Normal Weight	Over Weight	Under Weight	Normal Weight	Over Weight
Eighteen Month Longitudinal Group Day Care Sample	(4) 7%	(47) 82.5%	(6) 10.5%	(2) 2.1%	(82) 87.2%	(10) 10.7%
Eighteen Month Longitudinal Family Day Care Sample	(5) 7.1%	(58) 82.9%	(7) 10%	(6) 4.8%	(102) 81%	(18) 14.2%
Eighteen Month Cross-Sectional Sample	(5) 8.2%	(52) 85.3%	(4) 6.5%	(5) 8.2%	(52) 85.3%	(4) 6.5%
TOTAL	(9) 7.1%	(105) 82.7%	(13) 10.2%	(13) 4.6%	(236) 84%	(32) 11.4%

Table 7-5

Percent of Underweight, Normal Weight and Overweight Children in the Thirty-Six Month Sample

	WEIGHT FOR HEIGHT					
	Initial			At 36 Months		
SAMPLE	Under Weight	Normal Weight	Over Weight	Under Weight	Normal Weight	Over Weight
Thirty-Six Month Longitudinal Group Day Care Sample	(2) 3.9%	(46) 88.4%	(4) 7.7%	(2) 2.5%	(73) 93.6%	(3) 3.9%
Thirty-Six Month Longitudinal Family Day Care Sample	(3) 5.7%	(45) 84.9%	(5) 9.4%	(4) 5%	(73) 91.3%	(3) 3.7%
Thirty-Six Month Cross-Sectional Sample	(2) 2.6%	(73) 96.1%	(1) 1.3%	(2) 2.6%	(73) 96.1%	(1) 1.3%
TOTAL	(7) 3.9%	(164) 90.6%	(10) 5.5%	(8) 3.4%	(219) 93.6%	(7) 3%

CHAPTER 8 - COMPARISON OF HEALTH CARE AND SAFETY PROVIDED TO CHILDREN IN GROUP AND FAMILY INFANT DAY CARE PROGRAMS

The low-income Black and Hispanic children, who comprise approximately 90% of the children in public day care facilities in New York City and in the study, represent a high risk group in terms of poor health care (Birch and Gussow, 1970). Infant day care programs have a unique opportunity to improve the quality of health care of the children they serve, which may prevent serious health problems later.

The New York City Health Department also plays a different role in public group and family infant day care programs here. In addition to licensing the group programs, the NYC Health Department provides direct pediatric and nursing services to the group infant day care centers. Licenses must be renewed every two years. In order for an infant day care center's license to be renewed, children must be up to date on their immunizations and have had pediatric examinations every six months.

In regard to health care, Family Day Care programs are both licensed and regulated by the New York State Department of Social Services. Children in both types of day care programs are required to be up to date on their immunizations and have received a recent pediatric examination before being accepted into the program. However, while the NYC Health Department continues to provide direct pediatric care and supervises the health care of children in the Group Infant Day Care programs after they had entered the program, once a child enters a Family Day Care program the State does not closely supervise the continued medical care of children in these programs, nor does the NYC Health Department provide direct medical care to children. While some Family Day Care programs make arrangements for the medical care of the children in their programs, the responsibility for this lies largely with the child's parents, who may or may not inform the Family Day Care agency of immunizations or pediatric examinations of their children.

One of the purposes of the study was to see whether the quality of health care provided to children in Group and Family infant Day Care programs differed.

Method

The quality of health care provided to children in day care was evaluated on the basis of the day care agencies' health records on children. Copies of each sample child's health records were obtained every six months. On the basis of the records, the following three indices of the quality of health care were used:

(I) Immunization Status: Did the records indicate that the child has received all of the immunizations which are considered essential and appropriate for children of this age?

(II) Knowledge of Current Medical Problems: Did the records indicate that the day care agency independently knew about the child's current medical problems which our study physician found on the basis of a comprehensive pediatric examination?

(III) Follow-up On Reported Medical Problems: Medical problems which our study pediatricians found were reported in writing to the Director of the Day Care program, with recommendations for further diagnosis or treatment. Did the agency's health records contain the information we had provided, and had there been any further appropriate follow-up of the problem?

Since one of the primary responsibilities of caregiving adults or child-care facilities is to insure the physical safety of the children under their care, we also compared the Group and Family infant Day Care programs in terms of: (IV) the Physical Safety of Day Care Environment; and (V) Safety Practices by Caregivers.

We will now describe the methods for obtaining, coding, and analyzing the foregoing data in greater detail:

I. Immunization Status

The immunization of infants against diptheria, pertussis, tetanus, poliomyelitis, measles, rubella, mumps is, of course, a fundamental goal of pediatric practice with young children. The adequacy of childrens' immunizations against such diseases, as reflected in the day care agencies' health records, may be a particularly sensitive indicator of the quality of preventive health care provided to infants in day care.

In the present study, immunization status was assessed at approximately 6, 12, 18 and 36 months of age. On the basis of recommendations for optimal immunization of infants and young children in day care by the American Academy of Pediatrics (1974) and the New York City Health Department (1973), the Study Medical Committee developed rating scales of immunization status for each of the foregoing ages, ranging from excellent to poor. The scales and criteria for coding them at each of the foregoing ages are presented in Table 8-1.

Children in the 18-Month Longitudinal Group and Family Day Care samples were compared on: (1) Initial Immunization Status (at 6 or 12 months); and (2) Immunization Status at 18 Months of Age, controlling for initial immunization status. The 18-Month Cross-Sectional sample was compared to the Longitudinal Group and Family Day Care samples on Immunization Status at 18 Months of Age.

Children in the 36-Month Longitudinal Group and Family Day Care samles were compared on: (1) Initial Immunization Status (at 6, 12, or 18 moths); and (2) Immunization Status at 36 Months of Age, controlling for initial immunization status. The 36-Month Cross-Sectional sample was compared to the Longitudinal Group and Family Day Care samples on Immunization Status at 36 Months of Age.

On the basis of these analyses, we were able to determine: (a) whether the Longitudinal Group and Family Day Care samples differed in their immunization status when they first entered the program; (b) whether the type of infant day care program made a difference to children's immunization status at 18 or 36 months of age, after the children had been in these programs for varying lengths of time; and (c) how 18 and 36 month Cross-Sectional children, who had recently entered day care, compared to the Longitudinal children in this respect at these ages.

II. Knowledge of Current Medical Problems

The extent to which the infant day care programs knew about children's current medical problems, as reflected in the agencies' health records, which were detected by our study preditricians was also used to assess the quality of health care provided to babies in these programs.

Comprehensive pediatric examinations were carried out by physicians on our research staff of each sample child at approximately 6, 12, 18 and 36 months of age. The prediatricians used detailed, systematic protocols for carrying out these examinations and recording their findings. In accordance with the study design, our peditricians did not obtain medical histories on children, so that they were only able to diagnose current medical problems which could be detected by physical examination of the child or on the basis of laboratory tests. Our pediatricians were not given access to medical information about children contained in the day care agencies' records, so that the two sets of diagnoses were completely independent.

The completed pediatric protocols and laboratory reports were submitted to the Study Medical Director for review, disposition of detected medical problems, and for diagnostic coding. The diagnostic codes used in the present study were described in greater detail in Chapter 6 and are listed in Table 6-2.

Using the same diagnostic codes, physicians on our research staff coded the medical problems recorded in the day care agency health records for each sample child at approximately 6, 12, 18 and 36 months of age. The day care agency health records were coded independently of the information obtained by us from the pediatric examination. By comparing the two sets of findings on each sample child during the same age range, we were able to determine the degree of agreement or correspondence between the two independent sources of information about children's current health status.

The following criteria were used to define complete agreement or correspondence between the two sources of data: (1) We examined the child and the day care agency health record indicated that the child was also examined by another pediatrician during the same age period; and (2) both examinations were normal or both examinations detected exactly the same medical abnormality or abnormalities.

Children in the 18 Month Longitudinal Group and Family Day Care samples were compared on: (1) Initial Correspondence (at 6 or 12 months); and (2)

Correspondence at 18 Months of Age, controlling for initial correspondence. The 18-Month Cross-Sectional sample was compared to the Longitudinal Group and Family Day Care samples on Correspondence at 18 Months of Age.

Children in the 36-Month Longitudinal Group and Family Day Care samples were compared on (1) Initial Correspondence (at 6, 12, or 18 months); and (2) Correspondence at 36 Months of Age, controlling for initial correspondence. The 36-Month Cross-Sectional sample was compared to the Longitudinal Group and Family Day Care samples on Correspondence at 36 Months of Age.

On the basis of these analyses, we were able to determine: (a) whether the Longitudinal Group and Family Day Care samples differed in degree of correspondence when they first entered the program; and (b) whether the type of infant day care program made a difference in this respect at 18 and 36 months of age, after the children had been in the program for some time; and (c) how the 18 and 36 month Cross-Sectional samples compared with the Longitudinal samples in terms of correspondence at these ages.

III. Follow-Up on Reported Medical Problems

The Study Medical Director reported medical problems on 140 children to the Directors of 29 day care programs out of a total of 31 infant programs in the study. Fifty-nine letters were sent to 10 group day care centers, and 81 letters were sent to 19 family day care centers. These letters were sent on the basis of problems detected in the 6, 12 or 18 month pediatric examinations. We reviewed the subsequent day care agency records through 36 months of age on each of the 140 children for whom medical problems had been reported, in order to see whether: (1) the day care agency health record contained the information we had reported; and (2) whether there was evidence that further action had been taken on our recommendations, such as a referral for further diagnosis and treatment, or a report from the child's regular source of medical care on the specific problems which we had reported, etc.

We compared the group and family day care programs in terms of the proportion of problems which we had reported that were contained in children's day care agency health records. There was so little further follow-up on the problems we had reported that we did not statistically analyze this data, but it will be described later.

IV. Physical Safety of Day Care Environment

Data on the physical safety of the child's infant day care environment were obtained on the basis of all-day naturalistic observations in each longitudinal sample child's Group Day Care center classroom or Family Day Care home at approximately 12, 18, and 24 months of age. Using the Physical Safety Checklist, which includes a list of 15 indoor physical safety hazards, our Field Team Observers recorded whether each of the hazards were present or absent. The Checklist, which was developed in consultation with infant day care specialists from the New York City Health Department and Agency for Child Development, is presented in Table 8-2.

For each of the 15 Checklist items, if the particular safety hazard was not present, a score of 3 was given; if it was not known whether the hazard was present or not, a score of 2 was given; and if the hazard was present, a score of 1 was given. A Physical Safety Score was computed for each sample child on the basis of the summed weighted scores for the 15 items of the Checklist.

On the basis of the Physical Safety scores, with lower scores reflecting more safety hazards, we compared the Group and Family infant Day Care programs for the 12, 18 and 24 month samples children separately, in order to see whether the two types of day care programs differed in this respect at these ages.

V. Safety Practices by Caregivers

In addition to evaluating the physical safety of the day care setting, we assessed the safety practices by caregivers with children on the basis of all-day naturalistic observations of each sample child in his or her day care center classroom or family day care home at 12, 18 and 24 months of age.

Using the Suppliment to Core (which is described in greater detail later in this report), our Observers coded the safety practices of caregivers with a pre-selected sample child on the basis of five pre-determined 10 minute observation periods throughout the observation day.

On the basis of each 10 minute observation period, the Observer coded whether the child was in actual or potential danger. These included such danger situations as: (a) Child playing with small inedible objects, which can be swallowed; (b) child playing with dangerous objects (e.g. hot stove, knife, electric outlet, broken or sharp-edged toy, etc.); (c) child left unattended in high place; or (d) other danger or hazard. If there was no potential danger, a score of 2 was given. If there was a potential danger, a score of 1 was given.

The Observer also coded the caregiver(s)' response to the potential danger. If there was no danger or the caregiver intervened to prevent an accident, a score of 2 was given. If there was danger and the caregiver did not intervene, a score of 1 was given.

A Caregivers Safety Practices score was computed on the basis of the summed weighted scores for the five 10 minute observation periods, with higher scores reflecting better safety procedures.

Results

The results for the three quality of health care and two physical safety measures were as follows:

1. Immunization Status

The initial immunization status of the 18-Month Longitudinal Group Day Care sample was significantly better than that of the Family Day Care sample

($pr = -.236$, $t_{225} = -3.65$, $P \leq .01$). Controlling for the differences in initial immunization status, at 18 months of age the immunization status of the Group Day Care children was still signficantly better than that of the Family Day Care children ($pr = -.410$, $t_{227} = -6.76$, $P \leq .01$). At 18 months the immunization status of the Group Day Care sample was signficantly better than that of the 18 month Cross-Sectional sample ($pr = .195$, $t_{295} = 3.4$[illegible], $P \leq .01$), which in turn was significantly better in this respect than the Family Day Care sample ($pr = -.171$, $t_{295} = -2.98$, $P \leq .01$).

The 36-Month Longitudinal Group and Family Day Care sample did not differ in their initial immunization status, but the Group Day Care children were signficiantly better in this respect at three years of age than the Family Day Care children ($pr = .530$, $t_{167} = -3.07$, $P \leq .01$).

In comparing the three groups at 36 months, a significant difference was found in their immunization status ($I_R^2 = .259$, $F_{2,253} = 45.6$, $P \leq .01$). This difference was largely accounted for by Family Day Care which had a significantly worse immunization status than the 36 month Cross-Sectional sample ($pr = .441$, $t_{245} = 7.70$, $P \leq .01$), while there was no signficant difference between Group Day Care and the Cross-Sectional sample.

We also computed the percent of children in various samples at different times who had Excellent, Satisfactory, Unsatisfactory, and Poor immunizations. These percentages are presented in Tables 8-3 and 8-4. An examination of the foregoing tables indicates that there was a fairly consistent pattern:

1. The Longitudinal Group and Family Day Care samples did not differ greatly in their initial immunization status, but the children in the two programs differed greatly in this respect at 18 and 36 months of age. For example, 86 percent of the 36 Month Longitudinal Group Day Care children and 68 percent of the Family Day Care children had Excellent or Satisfactory immunizations when they first entered the program. However, by 36 months of age, 84 percent of the Group Day Care children and only 29 percent of the Family Day Care children had Excellent or Satisfactory immunizations.

2. The Longitudinal Group Day Care and Cross-Sectional samples did not differ greatly in their immunization status at 18 or 36 months of age, but the Cross-Sectional samples were signficantly better in this respect than the Family Day Care samples at these ages.

II Knowledge of Current Medical Problems

The 18-Month Longitudinal Group and Family Day Care samples did not differ in the percent of initial correspondence between the medical problems our study pediatricians found and those reported in children's day care agency health records; but by 18 months of age the percent of correspondence for the Group Day Care sample was significantly greater than for the Family Day Care sample ($pr = -.352$, $t_{220} = -5.58$, $P \leq .01$). Comparing the two Longitudinal samples and the Cross-Sectional sample, we find that, at 18 months, these three groups also differ significantly from each other

($I_R^2 = .110$, $F_{2,288} = 17.8$, $P \leq .01$). This difference is primarily attributable to the Family Day Care sample which showed significantly less agreement than the Cross-Sectional sample ($pr = .271$, $t_{284} = 4.74$, $P \leq .01$), while the Group Day Care sample and the Cross-Sectional sample did not differ from each other signficiantly.

The 36 Month Longitudinal Group and Family Day Care samples did not differ in initial percent of correspondence, but the Group Day Care sample was signficantly greater in this respect at three years of age than the Family Day Care sample ($pr = -.209$, $t_{158} = -2.69$, $P \leq .01$). The rate of correspondence among the three 36 Month samples were also signficantly different from each other. ($I_R^2 = .08$, $F_{2,240} = 10.7$, $P \leq .01$). It is again Family Day Care which is primarily responsible for this difference which had a significantly lower rate of correspondence than the Cross-Sectional sample ($pr - .291$, $t_{232} = 4.63$, $P \leq .01$). Group Day Care, also showed lower rate of correspondence than the Cross-Sectional sample. However, this difference was not signficant.

The percent of correspondence for various samples at different times are presented in Tables 8 - 5 to 8 - 8. In addition, the tables indicate the sources of disagreement: e.g. the day care agency's health records did not show that the child had received a pediatric examination by his or her regular source of care during the same age period, or there was disagreement about the presence or absence of medical problems, or about the nature of the child's medical problems, etc.

An examination of the foregoing tables indicates that there was a fairly consistent pattern:

1. The Longitudinal Group and Family Day Care samples did not differ significantly in initial correspondence, but the children in the two programs differed significantly in this respect at 18 and 36 months of age. For example, the initial correspondence for the 36 Month Longitudinal Group and Family Day Care samples were 36 percent and 33 percent respectively. By 36 months of age, however, the correspondence for the Group and Family Day Care samples were 25 percent and 9 percent.

2. The percent of correspondence for the Cross-Sectional samples were signficantly greater than for the Longitudinal Group and Family Day Care samples at both 18 and 36 months of age. For example, the correspondence for the 36 Month Cross-Sectional sample was 42 percent, in contrast to 25 percent and 9 percent for the Group and Family Day Care samples at three years of age.

3. The major reason for disagreement between the two sources of medical information about children was due to the fact that according to the day care agency's health records, there was no indication of a current pediatric examination by the child's regular source of care. This reason for disagreement was more prevalent in the Longitudinal Family Day Care than in the Group Day Care samples; and it was least prevalent for the Cross-Sectional samples. For example, about 53 percent of the Group Day Care sample, 82 percent of the Family Day Care sample, and only 15 percent of the Cross-Sectional sample apparently did not receive pediatric examinations from their regular sources of medical care between 30 and 40 months of age.

4. Both types of infant day care programs showed a marked decline in the number of children who had apparently not received a pediatric examination from their regular health care source from the time they entered the program to 18 or 36 months of age. The Family Day Care programs showed an even greater decline in this respect than the Group Day Care programs. For example, only nine percent of the 36-Month Longitudinal Group Day Care sample had no record of an initial pediatric examination, in contrast to 31 percent of the Family Day Care sample. By three years of age, however, 53 percent of the Group Day Care sample and 82 percent of the Family Day Care sample did not have a record of a recent pediatric examination; whereas only 15 percent of the 36-Month Cross-Sectional children did not have a record of a recent examination by their regular source of health care.

5. A second, though far less frequent reason for disagreement stemmed from the fact that our study pediatricians seemed to find more medical abnormalities than children's regular pediatricians, as reported in the day care agencies' health records. This may have been due to the fact that our pediatric examinations were more thorough; or that some of the minor abnormalities which we had detected were simply not reported by the child's regular doctor, because the physician may not have considered them worth reporting.

III. Follow-Up On Reported Medical Problems

The data on the day care agencies' follow-up on medical problems which we had reported to them are presented in Table 8-9. As the foregoing Table indicates, the follow-up on reported medical problems was fairly poor for both types of day care programs, but the Group Day Care programs did somewhat better in this respect than the Family Day Care programs.

Whereas eight out of 10 Group Day Care programs to whom we had reported medical problems contained such information in their health records, only four of the 19 Family Day Care programs contained any record of the problems which we had reported to them.

However, only 37 percent of the reports we had sent to the Group Day Care programs and 19 percent of the reports we had sent to the Family Day Care programs were contained in the day care agencies' health records; but the difference between the two types of day care programs in this respect was not statistically significant.

In regard to further follow-up on the information which we had provided, only 25 percent of the cases we had sent to the Group Day Care programs and 10 percent of the cases we had sent to the Family Day Care programs were referred for further diagnosis or treatment.

IV. Physical Safety of Day Care Environment

While there were no differences in the physical safety of the day care environment between the two types of day care programs for children at 12 months of age, there were significantly more physical safety hazards in the Family Day Care homes than in Group Day Care Centers for 18 (pr = .222, $t_{290} = 3.88$, $P \leq .01$) and 24 month old (pr = .302, $t_{212}=4.61$, $P \leq .01$) children.

V. Safety Practices by Caregivers

There were no significant differences between the Group and Family Day Care programs in the safety practices by caregivers with children at 12, 18 or 24 months of age.

Discussion

The quality of health care provided to children by the Group and Family Infant Day Care programs in the study was evaluated on the basis of the day care agencies' health records on children. Three specific indices were used to assess the quality of health care: (1) the extent to which children were properly immunized; (2) the extent to which the day care agencies independently knew about medical problems which our study pediatricians had detected; and (3) the extent to which the day care agencies follwed-up medical problems which we had reported to them.

On the basis of all three measures, the quality of health care provided to children in Group Day Care was significantly better than the health care received by children in Family Day Care.

In regard to immunizations, the two types of day care programs did not differ greatly when children first entered these programs. By 18 or 36 months of age, the Group Day Care children continued to be properly immunized, but the number of children in Family Day Care who were properly immunzed had dropped considerably. When they first entered the program, 86% of the 36 Month Longitudinal Group Day Care children and 68% of the Family Day Care children had excellent or satisfactory immunizations. By three years of age, 84% of the Group Day Care children and only 29% of the Family Day Care children had excellent or satisfactory immunizations.

In regard to knowledge of current medical problems, the two types of day care programs did not differ greatly when children first entered these programs. By 18 or 36 months of age, however, both types of programs delcined in this respect, but the Family Day Care programs showed a greater decline than the Group programs. The major reason for the day care agencies' lack of knowledge about current medical problems stemmed from the fact that there was no record of a recent pediatric examination by the child's regular source of health care, and this was more likely to be the case at 18 or 36 months of age, after the children had been in the program for some time.

Follow-up of reported medical problems was generally poor for both types of day care programs, but it was better in the Group than in the

Family Day Care programs. Whereas most of the Group programs contained some record of the problems which we had reported, very few of the Family Day Care programs had any record of the information we had provided. Thirty-seven percent of the cases reported to the Group programs were contained in the agencies' health records, but this was true for only 19% of the cases rported to the Family Day Care programs. Further follow-up was even less adequate, but the Group programs did significantly better in this respect than the Family Day Care programs, with 25% and 10% of the reported cases referred for further diagnosis or treatment in the two programs.

The caregivers in the two types of infant day care programs did not differ in terms of their safety practices with children, but there were significantly fewer indoor safety hazards in the Group Day Care centers than in the Family Day Care homes in the study.

The differences in quality of health care provided to children in the Group and Family Infant Day Care programs in the study may have been due to differences in the New York City Health Department's role in the two programs. While both types of day care programs were funded and operated under the auspices of the New York City Agency for Child Development, the Health Department played a much more direct and active role in the Group than in the Family Infant Day Care programs.

The Health Department supervised the health care provided to infants in the Group programs, but this was not the case for the Family Day Care programs. More importantly, the Health Department provided on-site pediatric services to 8 of the 11 Group Infant Day Care programs in the study. The other three Group programs made their own arrangements for pediatric care, but these were closely scrutinized by the Health Department. On-site pediatric care included age-appropriate immunizations, as well as regular pediatric examinations of all children in the Group Infant Day Care programs on the following schedule: (1) 2-6 month old babies were required to be examined every six weeks; (2) 6-18 month old infants were supposed to be examined every three months; and (3) 18-36 month old children had to be examined every six months.

The three Group Infant Day Care programs which had made their own health care arrangements were required to make certain that the children were properly immunized and that the children received the same scheduled pediatric examinations as children in the eight programs that provided on-site pediatric care.

Furthermore, all of the Group Infant Day Care programs were required to maintain comprehensive, up-to-date health records on each child, including a record of immunizations and medical problems. Part-time nurses, paid by the Agency for Child Development, were responsible for maintaining children's health records. The Health Department had considerable leverage over the Group programs in this respect. In considering the Group programs applications for renewing their licenses, which were required every year, the quality of health care provided and the completeness of the medical records were taken into account.

With the exception of one program, the Health Department did not provide on-site pediatric care to any of the other 19 Family Day Care programs in the study, nor did it have the responsibility for scrutinizing the Family Day Care Centers' health records on children. The Family Day Care programs either made their own arrangements for pediatric care, or left this responsibility to the child's family, in which case the Family Day Care Agency may not have received feedback on immuniztions or medical problems.

In the light of these differences in the Health Department's role in the two types of infant day care programs, it is not surprising that the Group programs provided better health care to children than the Family Day Care programs, as reflected in the day care agencies' health records. The two programs did not differ greatly in terms of immunizations or knowledge of current medical problems when children first entered these programs. Differences favoring the Group programs emerged at 18 and 36 months of age, after the children had been in the program for some time. The lack of initial differences between the two types of day care programs in these respects may have been due to the fact that when children first enter a day care program they are required to have their immunizations up-to-date and a recent pediatric examination. However, once children were in the program, the Family Day Care programs seem to have become lax in these respects. This interpretation of the findings is supported by the fact that the 18 and 36 month Cross-Sectional children, who had recently entered a day care program, were superior to the children in the Family Day Care programs at these ages, both in terms of immunizations and the day care agencies' knowledge of medical problems.

While the Group programs were superior to the Family Day Care programs in terms of knowledge of medical problems, as well as the percentage of children with recent pediatric examinations, approximately 50% of the Group programs in the study were not maintaining the schedule of required pediatric examinations. Both types of day care programs were particularly lax in at least keeping a record of the medical problems reported to them by the Study Medical Director, who considered these problems serious enough to report.

On the basis of these findings, both types of infant day care programs can be improved. But the Family Day Care programs may need to reconsider the role they have played in the health care of the children in their programs, so that in the future the quality of health care can be improved for children in Family Day Care, who comprise a majority of the children under three years of age in the public Day Care programs in New York City.

Table 8-1

Scales Used to Evaluate Children's Immunization Status at 6, 12, 18 and 36 Months of Age

6 Months

Excellent	1. 2-3 DPT[a] + 2-3 OPV[b]
Satisfactory	2. 2-3 DPT + 1 OPV; or 1 DPT + 2-3 OPV; or 1 DPT + 1 OPV
Unsatisfactory	3. 1 DPT or 1 OPV
Poor	4. No immunizations 5. Inappropriate immunizations (e.g. M[c], MR[d], or MMR[e] under 9 months of age)

12 months

Excellent	1. 3 DPT + 3 OPV; M or MR or MMR optional
Satisfactory	2. 2 DPT + 2 OPV; M or MR or MMR optional
Unsatisfactory	3. 2 DPT + 1 OPV; or 1 DPT + 2 OPV; or 1 DPT + 1 OPV
Poor	4. 1 DPT or 1 OPV; or none.

18 Months

Excellent	1. 3-4 DPT + 3-4 OPV + M and R[f]; or MR; or MMR
Satisfactory	2. 3 DPT + 3 OPV + M or R
Unsatisfactory	3. 3 DPT + 3 OPV; or 2 DPT + 3 OPV; or 3 DPT + 2 OPV
Poor	4. 2 DPT + 2 OPV 5. Less than 4 or none.

36 Months

Excellent	1. 4 DPT + 4 OPV + MR or MMR or M and R
Satisfactory	2. 3 DPT + 3 OPV + MR or MMR or M and R
Unsatisfactory	3. 3-4 DPT + 3-4 OPV + M or R 4. 2 DPT + 2 OPV + M and R or MR or MMR
Poor	5. 2 DPT + 2 OPV + M or R 6. 3-4 DPT + 3-4 OPV 7. Less than 6 8. Inappropriate immunization (e.g. too many: M at less than 1 year of age)

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a. DPT = diptheria, pertussis, tetanus
b. OPV = oral polio vaccine
c. M = measles
d. MR = measles, rubella
e. MMR = measles, murps, rubella
f. R = rubella

Table 8-2

INDOOR PHYSICAL SAFETY CHECKLIST

1. Windows are guarded
2. Paint is not peeling or flaking
3. Flooring is free from tripping and slipping hazards
4. Fire extinguisher is readily available
5. There is an uncluttered fire stairway or fire escape
6. Radiators are protected
7. Hot water/steam pipes are protected
8. Electric outlets, wires are protected
9. There are NO floor heaters
10. There are NO floor fans
11. There is a telephone on the premises
12. There are numbers for emergency posted near telephone
13. There are NO visible fire hazards
14. First aid supplies, insecticides, cleaning equipment, sharp objcts and medicines are out of children's reach
15. Children are protected when asleep (crib sides are up or other protection)

Table 8-3

Children's Immunization Status in the Eighteen-Month Sample

	IMMUNIZATION STATUS							
	Initial Immunization Status				Immunization Status at 18 Months			
SAMPLE	Excellent	Satisfactory	Unsatisfactory	Poor	Excellent	Satisfactory	Unsatisfactory	Poor
Thirty-Six Month Longitudinal Group Day Care Sample	(87) 86.2%	(6) 5.9%	(2) 2.0%	(6) 5.9%	(68) 69.4%	(15) 15.3%	(11) 11.2%	(4) 4.1%
Eighteen-Month Longitudinal Family Day Care Sample	(87) 64.9%	(11) 8.2%	(15) 11.2%	(21) 15.7%	(25) 19.4%	(13) 10.0%	(34) 26.4%	(57) 44.2%
Eighteen-Month Cross-Sectional Sample	(32) 50.8%	(6) 9.5%	(12) 19.1%	(13) 20.6%	(32) 50.8%	(6) 9.5%	(12) 19.1%	(13) 20.6%
TOTAL	(206) 69.2%	(23) 7.7%	(29) 9.7%	(40) 13.4%	(125) 43.1%	(34) 11.7%	(57) 19.7%	(74) 25.5%

Table 8-4

Children's Immunization Status in the Thirty-Six Month Sample

SAMPLE	IMMUNIZATION STATUS Initial Immunization Status Excellent	Satisfactory	Unsatisfactory	Poor	Immunization Status at 36 Months Excellent	Satisfactory	Unsatisfactory	Poor
Thirty-Six Month Longitudinal Group Day Care Sample	(67) 79.9%	(5) 5.9%	(7) 8.3%	(5) 5.9%	(62) 72.1%	(10) 11.7%	(7) 8.1%	(7) 8.1%
Thirty-Six Month Longitudinal Family Day Care Sample	(55) 61.8%	(6) 6.8%	(14) 15.7%	(14) 15.7%	(24) 25.8%	(3) 3.2%	(9) 9.7%	(57) 61.3%
Thirty-Six Month Cross-Sectional Sample	(53) 68.8%	(11) 14.3%	(4) 5.2%	(9) 11.7%	(53) 68.8%	(11) 14.3%	(4) 5.2%	(9) 11.7%
TOTAL	(175) 70%	(22) 8.8%	(25) 10%	(28) 11.2%	(139) 54.3%	(24) 9.4%	(20) 7.8%	(73) 28.5%

Table 8-5

Correspondence Between Initial Study Pediatric Exam and Day Care Agency Health Records on 18-Month Sample

SAMPLE	Both Exams Normal or Both Exams Show same Abnormalities	Our Exam done their exam not done	Our Exam Normal Their Exam Abnormal	Our Exam Abnormal Their Exam Normal	Both Exams Abnormal Diagnoses Disagree
Eighteen-Month Longitudinal Group Day Care Sample	(25) 39.7%	(6) 9.5%	(10) 15.9%	(15) 23.8%	(7) 11.1%
Eighteen-Month Longitudinal Family Day Care Sample	(30) 40.0%	(19) 25.3%	(4) 5.3%	(20) 26.7%	(2) 6.7%
Eighteen-Month Cross-Sectional Sample	(24) 37.5%	(23) 35.9%	(3) 4.8%	(12) 18.7%	(2) 3.1%
TOTAL	(79) 39.1%	(48) 23.8%	(17) 8.4%	(47) 23.3%	(11) 5.4%

Table 8-6

Correspondence Between Study Pediatric Exam and Day Care Agency Health Record on Children at 18 Months of Age

SAMPLE	Both Exams Normal or Both Exams Show Same Abnormalities	Our Exam Done Their Exam Not Done	Our Exam Normal Their Exam Abnormal	Our Exam Abnormal Their Exam Normal	Both Exams Abnormal Diagnoses Disagree
Eighteen-Month Longitudinal Group Day Care Sample	(35) 33.9%	(48) 46.6%	(8) 7.8%	(5) 4.8%	(3) 2.9%
Eighteen-Month Longitudinal Family Day Care Sample	(9) 7.0%	(108) 84.5%	(3) 2.3%	(4) 3.1%	(4) 3.1%
Eighteen-Month Cross-Sectional Sample	(24) 37.5%	(23) 35.9%	(3) 4.8%	(12) 18.6%	(2) 3.2%
TOTAL	(68) 23.4%	(179) 61.5%	(14) 4.8%	(21) 7.2%	(9) 3.1%

N = 291

Table 8-7

Correspondence Between Initial Study Pediatric Exam and Day Care Agency Health Records on 36 Month Sample

SAMPLE	Both Exams Normal or Both Exams Show Same Abnormalities	Our Exam Done Their Exam Not Done	Our Exam Normal Their Exam Abnormal	Our Exam Abnormal Their Exam Normal	Both Exams Abnormal Diagnoses Disagree
Thirty-Six Month Longitudinal Group Day Care Sample	(23) 35.9%	(6) 9.4%	(18) 28.1%	(14) 21.9%	(3) 4.7%
Thirty-Six Month Longitudinal Family Day Care Sample	(18) 32.7%	(17) 30.9%	(1) 1.8%	(18) 32.8%	(1) 1.8%
Thirty-Six Month Cross-Sectional Sample	(31) 41.9%	(11) 15.8%	(2) 2.7%	(27) 36.5%	(3) 4.1%
TOTAL	(72) 37.3%	(34) 17.6%	(21) 10.9%	(59) 30.6%	(7) 3.6%

Table 8-8

Correspondence Between Study Pediatric Exam and Day Care Agency Health Records on Children at 36 Months of Age

SAMPLE	Both Exams Normal or Both Exams Show Same Abnormalities	Our Exam Done Their Exam Not Done	Our Exam Normal Their Exam Abnormal	Our Exam Abnormal Their Exam Normal	Both Exams Abnormal Diagnoses Disagree
Thirty-Six Month Longitudinal Group Day Care Sample	(20) 25.3%	(42) 53.2%	(3) 3.8%	(12) 15.2%	(2) 2.5%
Thirty-Six Month Longitudinal Family Day Care Sample	(8) 8.9%	(74) 82.2%	(5) 5.6%	(1) 1.1%	(2) 2.2%
Thirty-Six Month Cross-Sectional Sample	(31) 41.9%	(11) 14.9%	(2) 2.6%	(27) 36.5%	(3) 4.1 %
TOTAL	(59) 24.3%	(127) 52.3%	(10) 4.1%	(40) 16.5%	(7) 2.8%

Table 8-9

Follow-Up by Infant Day Care Programs in Study of Reported Medical Problems

Type of Day Care Program	Number of Programs Reports Sent to	Number of Programs Containing Any Record of Reports	Reports sent	Number of Reports Contained in Day Care Records	Number of Reports Followed-Up Further
Group Day Care	(10)	(8) 80%	(59)	(22) 37.3%	(15) 25.4%
Family Day Care	(19)	(4) 21.1%	(81)	(15) 18.5%	(8) 9.9%
Total	(29)	(12) 41.4%	(140)	(37) 26.4%	(23) 16.4%

CHAPTER 9 - PSYCHOLOGICAL DEVELOPMENT OF CHILDREN IN STUDY

In assessing the effects of children's infant day care experience on their psychological development, we distinguished between the following two periods: (1) the first 18 months of life, which represents the preverbal or sensorimotor period; and (2) from 18 to 36 months of age, when language plays a more important role in children's psychological experience and development.

The effects of children's infant day care experience on their psychological development were assessed at two key ages: at 18 and 36 months of age. The environmental conditions which facilitate children's intellectual development during the preverbal and verbal periods differ. During the sensorimotor period children raised in residential institutions tend to develop more poorly intellectually than children reared at home by their own families (Bowlby, 1951; Provence and Lipton, 1962). Home-reared children from different social classes generally do not differ in their performance on standard intelligence tests, which becomes quite marked by the third year of life (Hindley, 1962; Golden et al, 1971; Golden and Birns, 1976).

Proponents of infant day care believe that such programs offer an opportunity to provide children from low-income families (who constitute the majority of the children in public day care programs in New York City) with the kind of cognitive and verbal enrichment which might prevent this relative decline in their intellectual development.

In studying the effects of infant day care on children's psychological development, we also distinguished between their cognitive/language and their social/emotional development. There is evidence that the environmental conditions which facilitate intellectual and social development may differ. White (1975) found that at 12 months of age children from different social classes did not differ on his measures of intellectual or social competence. However, at three years of age there were social class differences in intellectual competence, but there were no differences in social competence.

Opponents of infant day care, particularly group day care for babies, have been especially concerned with the potentially detrimental effects of early separation of infants from their families and placement into a day care program on their social and emotional development. Proponents of family day care have assumed that children in family day care homes are more likely to receive the kind of individual attention they need to facilitate their social and emotional development. On the other hand, proponents of group day care for infants have assumed that, because of the presence of professional educators on the premises, children in group care are more likely to be provided the kind of experiences which would stimulate their cognitive and language development than children in family day care. It is also assumed that the later children are separated from their families and placed into a day care program, the better it is for their psychological development. One of the purposes of this study was to see whether these widely held assumptions are valid or not.

While the 18 and 36 month assessments represent two key ages, in terms of evaluating the effects of infant day care on children's psychological development, we did not consider them of equal importance. At 18 months we studied the short-term, immediate impact of separation from the family and placement into day care on infants. The 36 month evaluation is more important for several reasons. It marks the end of the infant day care period, and is the final assessment of the effects of infant day care on children's psychological development. By three years of age, the immediate impact of separation from the family has worn off and we are in a better position to assess the relatively more long-term, stable effects of infant day care on children's psychological development.

Method

At 6, 12 and 18 months of age we relied primarily on the Bayley Mental Scale to assess children's psychological development.

Since we considered the 36-month assessment to be more important, we carried out a comprehensive, in-depth evaluation of children's cognitive, language, social, and emotional development, which required two full mornings to complete for each child in the study.

At three years of age each child in the study was evaluated under the following three conditions: (1) Standard Test Situation, which included the Stanford-Binet Intelligence Scale and the Peabody Picture Vocabulary Test; (2) a 45-minute Play Interview, in which the child was presented with a variety of age-appropriate play materials and encouraged to play with them and to interact with the Examiner in any way he or she desired; and (3) Naturalistic Observations, in which each child in the study was observed in his or her usual day care environment on two different mornings, about a week apart, for 45 minutes on each occasion.

The use of standard tests, such as the Stanford-Binet and Peabody, makes it possible to compare the intellectual and language development of the children in this study with children in similar studies throughout the United States. By three years of age children's performance on such tests predict their later intellectual development and academic achievement fairly well, so that these measures reflect how well children's infant day care experience during the first three years of life has prepared them for school. However, such tests tap a relatively narrow, restricted range of children's psychological functioning, even in the cognitive and language areas. Furthermore, they tend to be biased in terms of social class and culture, and hence may be unfair to the low-income minority children in this study. Finally, we considered it essential to assess the effects of infant day care on children's social and emotional development, which standard tests do not adequately measure.

The Naturalistic Observations provide us with an opportunity to see how children function in their usual infant day care settings, particularly how they relate to familiar adults and peers. However, day care environments differ greatly, both in terms of their human and non-human aspects, which may affect the sample child's behavior.

The Play Interview provides an opportunity to see how children function in a more standard situation than the Naturalistic Observations, but where the child has greater freedom to use the materials and relate to the Examiner on his or her own terms than in the Standard Test Situation.

Each of the three assessment situations has advantages and disadvantages. By observing children under all three conditions, which compliment one another, and by seeing children on two different mornings, we believe that we have obtained as rich and as balanced a picture of each child's psychological functioning as possible, given the resources we had available to evaluate several hundred children in a relatively short period of time.

Children's behavior in each of the three situations were rated by the Examiner on the same sets of 7-point behavior rating scales dealing with the following five major areas of functioning: (A) Language Competence; (B) Cognitive Style,[1] (C) Social Competence with Adults; (D) Social Competence with Peers (which, of course, can only be rated during the naturalistic observations, if there are peers present); (E) Adequacy of Emotional Functioning. Each of the five major scales include several sub-scales, which were combined for purposes of data analysis. (See Table 9-1 for a more detailed description of the scales).

The Social Competence Scales were devloped by Burton White at Harvard University and were adapted for use in the present study in consultation with him. In constructing the other three sets of scales, we combed the early child development literature. We found very few procedures for evaluating the cognitive/language and social/emotional functioning of three year old children in a play interview or on the basis of naturalistic observations, which would be suitable for such a large-scale study. The Language Competence, Cognitive Style, and Adequacy of Emotional Functioning scales were developed by our research team. We were greatly aided in the devlopment of the 36-month psychological evaluation procedures by Edna Shapiro, our early childhood consultant from the Bank Street College of Education.

In addition to the foregoing measures, we included the Peabody Picture Vocabulary Test for several reasons. About half of the children in the study were Hispanic, with varying degrees of experience and competence in the English language. On the Bayley and Stanford-Binet , our bilingual Examiners tested the Hispanic children in their best language, which in most cases was Spanish, or in a combination of English and Spanish. We felt that it would be of great interest to assess the relative competence of the Hispanic children in English and Spanish, and to relate their competence in the two languages to their language experience in day care, which we also assessed. In order to do this, we administered different forms of the Peabody in Spanish and English to the Hispanic children at three years of age, with a different version on each of the two mornings the children were seen. The Spanish versions of both the Stanford-Binet and Peabody were made available to us by Frank Palmer at Stony Brook, who had these tests translated into Puerto Rican Spanish for his own research.

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[1] Cognitive Style was not rated during the naturalistic observation, because the variety and quantity of play materials varied too greatly from one day care setting to another.

The foregoing assessment battery required two full mornings to complete, approximately a week apart, and was completed as close to the child's third birthday as possible. The time frame for carrying out these assessment procedures was as follows:

First Morning:

(1) Naturalistic Observation: First the Examiner observed the sample child in his or her day care center classroom or family day care home for 45 minutes. During this time the Examiner was as unobtrusive as possible and interacted as little as possible with children or caregivers. At the end of the 45-minute observation period, the Examiner rated the sample child's behavior on the behavior rating scales. Social Competence with Peers was only rated if there was another child present between 2 and 4 years of age, which was not always the case in family day care homes.

(2) Play Interview: After completing the behavior ratings at the end of the naturalistic observation period, the Examiner approached the sample child and attempted to establish rapport with the child before taking the child to a more private location for the play interview. The Examiner talked to the child about his or her favorite activities and playthings. When the child seemed comfortable with the Examiner, she would say, "I've got some nice toys for you to play with." The child was led to a relatively quiet, private location, away from other children. In a day care center there was usually an office which could be used for this purpose. In a family day care home, the child was taken to another room in the apartment, where the Examiner could be alone with the child.

The Examiner presented the child with the following types of play materials: (a) Family dolls; (b) Furniture (kitchen, bathroom, bedroom, etc.) ; (c) Eating utensils; (d) Vehicles (cars, planes, etc.); (e) Animals (domestic and wild); and (f) Building blocks. The Examiner played a relatively non-directive, responsive role, a particpant-observer who followed the child's lead. At the end of the 45-minute play interview, the Examiner rated the child's behavior on the behavior rating scales.

(3) Peabody Picture Vocabulary Test: The English form of the Peabody was presented to all children, including Spanish-speaking children, and required about 10 minutes to administer.

Second Morning:

(1) Stanford-Binet Intelligence Scale: Having had an opportunity to establish rapport with the child the previous week, the Examiner could more

readily obtain the child's optimal performance on the Stanford-Binet, which was administrered first on the second visit. It required about 45 to 60 minutes to complete for most children. The Spanish version of the Binet was given to the Hispanic children, although the Examiners used both Spanish and English in testing these children, At the beginning of the testing session the child was told, "This is going to be more like school," so that the child knew that what was expected would be different than the play interview. When the Binet testing was completed, the Examiner rated the child's behavior on the behavior rating scales.

(2) Peabody Picture Vocabulary Test: The Spanish version of the Peabody was adminsitered to the Hispanic children.

(3) Naturalistic Observation: The same procedure was followed as on the first morning. In order to minimize the child's attempts to interact with the Examiner during the observation period, the Examiner told the child that she had some work to do, and would spend some time with the child later. At the end of the 45-minute observation period, the Examiner rated the child's behavior on the behavior rating scales.

The 36-month psychological assessment team consisted of fairly experienced people, who were beyond the Masters level and have had extensive diagnostic, clinical or educational experience with young children. The Examiners were all females. Hispanic children were evaluated by Examiners fluent in both English and Spanish, who used both languages in assessing these children.

Prior to making independent assessments of 36-month sample children, the Examiners underwent a period of intensive training over a period of several months in the use of the 36-month psychological procedures. Since the Examiners were fairly experienced in the use of standard psychological tests, the focus of the training was on how to conduct the play interview and carry out the naturalistic observations, with particular emphasis on the use of the behavior rating scales. In order to facilitate the training of the Examiners, we developed a comprehensive detailed Training Manual for the Thirty-Six Month Psychological Asessment Procedures. (The Training Manual was submitted to MCHS and Carnegie, our funding agencies, in a previous progress report).

During the training period, intra-class correlations were computed on the ratings made by the Trainer and each Examiner for each child they had seen together. When the level of agreement was considered satisfactory (with intra-class correlations of about .90 or more), the Examiner was allowed to evaluate children independently.

While it was not feasible to carry out a formal reliability study on the behavior rating scales before we began to collect data on the 36-month sample, we obtained reliability estimates of the rating scales by pairing our five Examiners as often as possible throughout the period of time this data was collected. The Inter-Judge reliability estimates were based on paired ratings of 59 children on their behavior during the 45-minute play interview and 45-minute naturalistic observation. The intra-class Inter-Judge reliability estimates for the five behavior rating scales ranged from .72 for Cognitive Style to .92 for Language Competence (See Table 9-20).

For purposes of data analyses, we computed the following five scores for each sample child, on the basis of the behavior ratings in all three situations combined (i.e. the Standard Test Situation, Play Interview, and two 45-minute Naturalistic Observations): (A) Language Competence; (B) Cognitive Style; (C) Social Competence with Adults; (D) Social Competence with Peers; and (E) Adequacy of Emotional Functioning.

Results

At about 18 months of age, the 18-month Group Day Care, Family Day Care, and Cross-Sectional samples were compared on the Bayley Mental Scale. The Group and Family Day Care children entered the program between 2 and 14 months of age, and the Cross-Sectional children entered the program between 15 and 21 months of age.

When all three groups of children were compared, there was a significant difference among their 18-month Bayley Mental scores ($I_R^2 = .034$, $F_{2,289} = 5.07$, $P \leq .01$). The Mean Bayley scores for the Group Day Care, Family Day Care and Cross-Sectional children were 100.4, 98.0, and 92.9 respectively. Whereas the Group and Family Day Care children did not differ significantly, the Group Day Care children obtained significantly higher Bayley scores than the Cross-Sectional children ($pr = .183$, $t_{285} = 3.15$, $P \leq .01$). While the Family Day Care children also obtained higher Bayley scores than the Cross-Sectional children, the difference was not statistically signficant.

The age when children entered the program, from 2 to 14 months of age, was not related to their Bayley Mental scores at 18 months.

At about three years of age, the 36-month Group Day Care, Family Day Care, and Cross-Sectional samples were compared on the following measures: the Stanford-Binet Intelligence Scale, the Peabody Picture Vocabulary Test, and the five behavior rating scales described earlier.

The Group and Family Day Care children entered the program between 2 and 21 months of age, and the Cross-Sectional children entered the program between 30 and 40 months of age.

When all three groups of children were compared, there was a significant difference among their 36-month Stanford-Binet scores ($I_R^2 = .051$, $F_{2,247} = 6.76$, $P \leq .01$). The Mean Binet scores for the Group Day Care, Family Day Care, and Cross-Sectional children were 99.1, 92.0, and 92.6 respectively. The Group Day Care children obtained significantly higher IQ scores than the Family Day Care ($pr = .263$, $t_{162} = 3.47$, $P \leq .01$) and Cross-Sectional children ($pr = .188$, $t_{239} = 2.96$, $P \leq .01$). The Family Day Care children did not differ signficantly from the Cross-Sectional children.

Discussion

While Group Day Care children obtained significantly higher scores on standard intelligence tests than similar low-income home-reared children at 18 and 36 months of age, Family Day Care children did not differ significantly from home-reared children in their intellectual performance at these ages.

While the Group and Family Day Care children did not differ in the development of sensorimotor intelligence during the first 18 months of life, by three years of age the Group Day Care children obtained significantly higher scores than the Family Day Care children on the Stanford-Binet, a measure of verbal intelligence. This pattern is similar to what one finds in studies of social class differences in intellectual development, where SES differences on standard intelligence (IQ) tests also first manifest themselves between 18 and 36 months of age, when language becomes more important for learning.

Whereas the Group Day Care children maintained approixmately the same level of intellectual performance between 18 and 36 months of age, the Family Day Care children declined in their intellectual performance after 18 months, and did not differ from comparable low-income home-reared children in their intellectual development during the first three years of life. While the Group Day Care programs succeeded in preventing the decline in intellectual performance generally manifested by low-income children after 18 months of age, the Family Day Care programs were not as successful in this respect (See Figure 9-1).

The superiority of the Group Infant Day Care children was only manifested on the Stanford-Binet, a standard intelligence test. Children cared for under three types of child-rearing conditions during the first three years of life -- Group Day Care, Family Day Care, and at-home -- did not differ in their everyday use of language or cognitive functioning outside of a test situation, nor did they differ in how they related to people or coped with feelings.

The age when children entered a Group or Family Infant Day Care program, from 2 to 21 months of age, did not relate to any aspect of their psychological development at three years of age.

In recent comprehensive reviews of infant day care research (Bronfenbrenner et al 1976; Ricciuti, 1976), the authors concluded that children with extensive Group Infant Day Care experience did not suffer from this experience during the first few years of life. Children from middle-class families were neither benefited nor harmed by such experience. Lower-class children benefited from the experience. Low-income children in Group Infant Day Care programs developed better intellectually than comparable home-reared children, but the difference emerged after 18 months of age, when language plays a more important role in cognitive development.

However, these studies were carried out on children in a few university-based, research-oriented, model Group Day Care centers, where infants were provided with a great deal of cognitive, language and social enrichment. On the basis of a longitudinal study of several hundred children in 31 typical, service-oriented, relatively new Group and Family Infant Day Care programs we have demonstrated that low-income children with several years of infant day care experience, particularly in a Group Day Care setting, developed as well and in some respects developed better than comparable home-reared children during the first three years of life.

A similar pattern was present for the Peabody Picture Vocabulary Test, but the differences among the three 36-month samples fell just short of the .01 level of significance. The Mean Peabody scores for the Group Day Care, Family Day Care, and Cross-Sectional children were 81.1, 75.7 and 76.5 respectively.

TABLE 9-1

Thirty-Six Month Behavior Rating Scales

(A) Language Competence

1. Extent to which child talks.
2. Extent to which child can be understood.
3. Extent to which child's language is complex and fluent.
4. Extent to which child's use of language is abstract.
5. Extent to which child verbalizes about ongoing activities and experiences.
6. Extent to which child uses language to obtain information.

(B) Cognitive Style

1. Extent to which child becomes involved in an activity.
2. Extent to which child shows curiosity, exploratory behavior.
3. Extent to which child expresses creativity, imagination.
4. Extent to which child's play is symbolic.
5. Extent to which child's activities show organization, planning, selectivity.
6. Extent to which child is flexible.
7. Extent to which child's play is complex.

(C) Social Competence with Adults

1. Extent to which child obtains adult attention thru socially accepted means.
2. Extent to which child selectively uses adult as an instrumental resource.
3. Extent to which child expresses both positive & negative feelings with adults.
4. Extent to which child both complies & does not comply with adult directives.
5. Extent to which child expresses pride.
6. Extent to which chuld identifies with adult role & expresses the desire to grow up.
7. Extent to which child directs adult in appropriate way.

(D) Social Competence with Peers

1. Extent to which child successfully obtain's peer's attention.
2. Extent to which child both leads and follows peers.
3. Extent to which child expresses both positive & negative feelings towards peers.
4. Extent to which child competes with peers for equipment or adult attention.

(E) Adequacy of Emotional Functioning

1. Extent to which child openly manifests feelings.
2. Extent to which child manifests happiness, pleasure.
3. Extent to which child manifests anger.
4. Extent to which child manifests anxiety, fear.
5. Extent to which child exhibits unhappiness through crying.
6. Extent to which child manifests vitality, liveliness.
7. Extent to which child modulates impulses.
8. Overall evaluation of child's emotional functioning.

Table 9-2

Intra-Class Inter-Judge Reliability Estimates for Thirty-Six Month Behavior Rating Scales

Behavior Rating Scale	N	R_1
1. Language Competence	59	.92
2. Cognitive Style	59	.72
3. Social Competence with Adults	59	.87
4. Social Competence with Peers	47[a]	.74
5. Adequacy of Emotional Functioning	59	.73

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[a] The N for Social Competence with Peers was smaller, because in some of the Family Day Care homes there were no peers present when the sample child was observed.

Table 9-3

Mean Bayley Scores of Children in Eighteen-Month Sample

SAMPLE	MEAN BAYLEY SCORES Initial Scores N	Mean	SD	Scores at 18 Months N	Mean	SD
Eighteen-Month Longitudinal Group Day Care Sample	68[b]	108.5	16	93[b]	100.4	15
Eighteen-Month Longitudinal Family Day Care Sample	79[b]	112.5	16	133[b]	98.0	14
Eighteen-Month Cross-Sectional Sample	66[a]	93.1	16	66[a]	92.9	16

[a] The Bayley scores of the children in the Eighteen-month Cross-Sectional Sample are presented both as initial and as 18-month scores for comparative purposes.

[b] The N's for the initial and 18-month scores differ, because we were unable to obtain intial measures on 79 Longitudinal children.

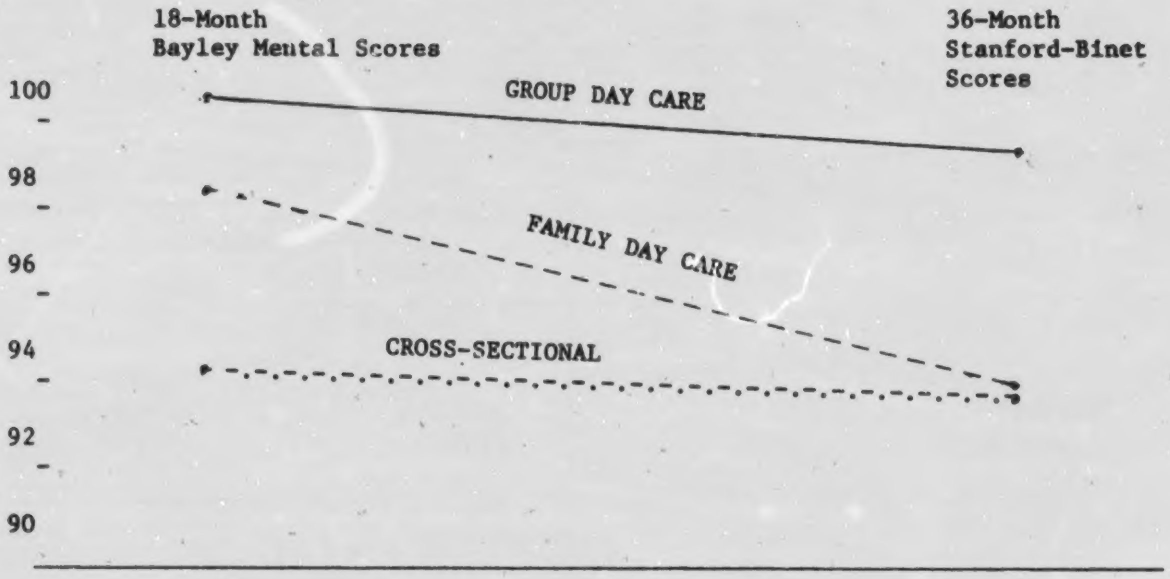
Table 9-4

Mean Stanford-Binet and Peabody Scores of Children in the Thirty-Six Month Sample at Three Years of Age

	MEAN TEST SCORES					
	Stanford-Binet			Peabody		
SAMPLE	N	Mean	SD	N	Mean	SD
Thirty-Six Month Longitudinal Group Day Care Sample	82	99.1	12	81	81.1	11
Thirty-Six Month Longitudinal Family Day Care Sample	91	92.0	14	84	75.7	12
Thirty-Six Month Cross-Sectional Sample	77	92.6	13	77	76.5	13

Figure 1

Eighteen and Thirty-Six Month Mean IQ Scores of Group Day Care, Family Day Care, and Cross-Sectional Samples[a]



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a. It is important to keep in mind that the mean IQ scores at 18 and 36 months of age were not based on exactly the same children. Whereas the 36-month Group and Family Day Care children were previously tested at 18 months, the 36-month Cross-Sectional children were not tested prior to three years of age, and were not the same children as in the 18-month Cross-Sectional sample. For a more detailed description of the samples, see Chapter 5.

CHAPTER 10 - COMPARISON OF CHILDREN'S PSYCHOLOGICAL EXPERIENCES IN GROUP AND FAMILY INFANT DAY CARE AND HOW THESE RELATE TO THEIR SUBSEQUENT PSYCHOLOGICAL DEVELOPMENT

Studies of infant day care have usually focused on the effects of day care on children's psychological development, but children's psychlogical experiences in these programs have not generally been studied.

Assumptions are often made about differences in the psychological experiences of infants in Group and Family Day Care programs, which are not supported by research evidence. Opponents of Group Day Care for babies have argued that infants in Family Day Care programs are more likely to receive the kind of individual attention they need. On the other hand, proponents of Group Day Care have argued that children in Group Day Care programs are more likely to receive the kind of cognitive and verbal enrichment they need to facilitate their intellectual and language development, because of the presence of professional early childhood educators in the centers.

In order to obtain empirical data on these issues, children's psychological experiences in infant day care programs were studied by means of direct, systematic, all-day naturalistic observations of each sample child in his or her Group Day Care classroom or Family Day Care home at 12, 18 and 24 months of age. In studying infant day care programs, our strategy was to focus on the psychological experiences of each individual child in the study, rather than studying children in a particular day care setting as a group, or the behavior of caregivers in general.

In assessing children's psychological experiences in infant day care, we distinguished among the following three major program components: (A) the Physical Environment, which included the play materials and space available to the child, as well as how free or restricted the child was in exploring the environment; (B) the Caregiver(s)' Behavior with the Child, which included the amount of individual attention the child received, as well as the specific cognitive/language and social/emotional stimulation provided to the child; and (C) the Child's Behavior, which included the child's cognitive/language and social/emotional functioning.

These three major aspects of children's psychological experiences were studied as a function of: (1) Type of Infant Day Care Program (Group vs. Family Day Care); and (2) Age of Entry into the Program (ranging from 2 to 21 months of age). The first issue is concerned with whether children's psychological experiences in Group and Family Day Care programs differ in the foregoing respects. The second issue is concerned with whether children who have been in the program for different lengths of time differ in their psychological experiences when they were observed at the same ages (i.e. 12, 18, 24 months of age).

We also believed that it was important to find out whether differences in children's psychological experiences in the two types of infant day care programs were related to differences in their subsequent psychlogical development. In addition, we were interested in studying the relationships between children's individual experiences in infant day care and various aspects of their psychological development, in order to find out what kinds of experiences facilitate children's development, regardless of type of infant day care program.

Method

Data on children's infant day care experiences were obtained at 12, 18 and 24 months of age. Female Field Team Observers visited each child in the study every six months in his or her Group Day Care classroom or Family Day Care home from approximately 9:30 a.m. to 4:30 p.m. Focusing on an individual (pre-selected) sample child, the Observer recorded (on a set of pre-coded protocols) various aspects of the child's psychological experience throughout the observation day. Bilingual Observers were used for Hispanic children, or in the case of English-speaking children with Hispanic caregivers.

The Observers followed the sample child throughout the whole observation day and coded that child's behavior, whether the child was interacting with other people or not. Caregivers' behavior were only coded on the basis of their interactions with the sample child who was being observed that day. Our system for coding the behavior of caregivers was suitable for settings in which there was only one caregiver present or several caregivers who may interact with the child at different times. In general, we did not attempt to characterize the behavior of individual caregivers, but to assess the quality of caregiving which the child experienced in a particular day care setting, whether it was provided by one or several caregivers. Interactions with peers were recorded, but the Observers only coded the sample child's behavior with other children.

It was necessary to develop measures which could be used in both Group Day Care classrooms and Family Day Care homes, since the two settings differ in certain essential respects, which make comparisons difficult. In addition to obvious differences in the physical environment, there are also great differences in social structure: in a Group Day Care classroom there are usually about 10 children who are homogeneous in age, with several caregivers; whereas in a Family Day Care home there is generally one caregiver and fewer children, who are heterogeneous in age; and at times there may be no other children present in a Family Day Care home.

We attempted to bridge such fundamental differences in social structure by focusing on the psychological experiences of individual children and by comparing the experiences of individual children in the two types of infant day care settings. Furthermore, such an approach made it possible to study the relationships between children's individual infant day care experiences with various aspects of their psychological development.

The Observers used the following instruments, which were developed by our research team, to code the naturalistic observations:

Core

Core was the principal method employed to obtain quantitative data on children's psychological experiences in infant day care. Core involves a time-sampling technique, in which 30 seconds of observation is paired with 60 seconds forcoding 16 major categories in the behavior of children and caregivers. Core provides frequencies of the following types of behavior throughout the observation day. How restricted or free is the child to explore the environment ? Is the child in a highchair, playpen, on the floor, etc? What is the child's predominant emotional state? Is the child happy, unhappy, or neutral? Is the child vocalizing, and if so, is the child's speech intelligible? What activity is the child engaged in? Is it primarily social, large-motor activity, fine-motor activity, or is the child doing nothing? Is the child interacting with another person, and if so, whom? If the child is interacting with the caregiver, is it individually or in a group? Is the interaction with the caregiver in a routine child-care situation or not? If necessary, does the caregiver comfort the child, or show affection? Does the caregiver play with the child, or attempt to teach the child something? If so, what is she teaching? language? self-help skills? Does the caregiver attempt to control the child's behavior? If so, does she use positive or negative control techniques? Does she speak to child? Is the caregiver's emotional state predominantly positive, negative, or neutral?

A Core sample consists of 7 consecutive observation/coding units, which requires about 10 minutes to complete. The Observer was required to obtain five 10-minute Core samples throughout the day; two in the morning, two in the afternoon, and one during the noon meal. In order to prevent Observer bias, Core samples could only be obtained during certain predetermined periods throughout the day, with the exception of the noon meal, which was coded whenever it occurred. Core samples were not obtained when the child was asleep.

Core was pre-tested extensively and found to be suitable for coding the behavior of caregivers and children between 6 and 36 months of age, in both Group Day Care center classrooms and Family Day Care homes. Observer reliability for Core is quite high, with reliability coefficients ranging from .73 to .98, with only two reliability estimates falling below .80.

Core Supplements

The Core Suppliment was coded at the end of each 10 minute Core sample. It included the following kind of information. How many caregivers and children are present in the room? What is the caregiver/child ratio? Was the sample child in physical danger, and if so, how did the caregiver deal with it? What languages were spoken to the child? English, Spanish or both languages? Did the Observer see any unusual behavior by the caregiver or child? If so, she was asked to describe it.

Checklists of Caregiver-Child Behavior During Learning, Control, and Language Interactions

The Observers also completed Checklists of Caregiver-Child Behavior During Learning, Control, and Language Interactions. In contrast to Core, which employs relatively brief 30-second observation units, the Checklists were coded on the basis of more extensive 10-minute periods of continuous observation, which were interspersed throughout the observation day. The Checklists were designed to assess more extended interaction patterns between the child and caregiver(s) in these three areas.

When the child and caregiver were involved in a learning situation, the Observer coded such things as: whether it occurred in a group or individually, what the learning activity was and who chose it, what kinds of teaching and motivational techniques the caregiver used, how much interest and involvement did the child and caregiver manifest during the learning activity, etc.

With respect to control situations, the Observer coded the circumstances which prompted the caregiver to attempt to control the child's behavior. Was the child engaged in wild, noisy, disruptive behavior? Was the child destroying play materials or doing something dangerous to himself or other children? Or was the child simply playing with something or in an area which the caregiver considered off-limits? How did the caregiver attempt to control the child's behavior? Did she explain the reasons? Did she divert the child by introducing a different activity? Did she denigrate, scold, or physically punish the child? What was the outcome? Did the child comply? If not, did the caregiver persist until the child complied, or did she give up?

In regard to caregiver-child language interactions, the Observer coded the following types of verbal behavior. Did the caregiver verbalize about the child's ongoing activity or experience? Did she attempt to teach language? Did the caregiver reinforce the child's attempts to communicate verbally by responding? In assessing the child's language, the Observer coded the following aspects of verbal behavior. Was the child's speech generally intelligible? Did the child primarily express himself in single word sentences, phrases, or complete sentences? Did the child ask questions, or respond to questions?

The Observer was required to make observations until two control, and two language interaction samples were obtained. Such samples may be relatively brief or fairly extended.

Food Record

Using the Food Record (which was developed by Catherine Cowell, Director of the New York City Health Department Bureau of Nutrition), the Observer coded the specific kinds of foods presented and eaten by the sample child during the noon meal and snacks. The Observer only coded the types of food the child ate, and not the quantity of food ingested. On the basis of the data obtained from the Food Record we computed Positive, Negative and

Total Nutrition Indexes for each child. These were described in greater detail in Chapter 7 of this report, dealing with children's nutrition and physical growth.

Suppliment to Food Record

In addition to the noon meal Core, the Observer completed the Supplement to the Food Record, which was designed to assess the pattern of caregiver-child interaction on the basis of the Observer's observations of the entire noon meal. It included such information as: whether the child was fed individually or in a group, whether the emotional atmosphere during the noon meal was predominantly positive or negative, whether the caregiver provided cognitive and verbal enrichment during the noon meal, etc.

Summaries of Caregiver(s)' and Child's Behavior

The Observer also rated caregiver(s)' behavior and the child's behavior on the basis of the whole day's observations. The Observer completed these ratings at the end of the observation day, and provided the Observer with an opportunity to summarize or synthesize her impressions of the entire day's transactions.

In rating the caregiver's behavior, the Observer rated such things as: how much the caregiver seemed to enjoy the child, how responsive she was to the child's social overtures, how much she encouraged the child's explorations, how much cognitive and verbal enrichment she provided, etc. In rating the child's behavior, the Observer rated such things as: how well the child related to adults and peers, how much curiosity the child manifested, how task-oriented the child was, etc.

Physical Setting, Materials, and Equipment Checklist

While the sample child was napping, the Observer completed the Physical Setting, Materials, and Equipment Checklist. The Checklist was designed to assess physical aspects of the day care environment which may be related to the child's psychological development. It included information on the adequacy of the play space; the types, quantity, and age-appropriatness of the play materials and equipment; eating and sleeping arrangement; bathroom and diapering facilities; and the presence of safety hazards, which were coded on the Physical Safety Checklist. This was described in greater detail in Chapter 8 of this report.

The protocols used by the Field Team Observers for coding the naturalistic observations have been submitted in previous Progress Reports. Data on inter-observer reliability on the foregoing measures were submitted in the January 1976 Progress Report (See pages 43-44).

The instruments and specific items used in coding the naturalistic observations were developed in the following way. The initial pool of items for instruments, such as Core, were selected in a series of meetings with a panel of child development and early childhood education specialists. The panel included people from the New York City Agency for Child Development and Health Department (Co-Sponsors of the study); recognized authorities in the field from several Universities in the area; an educational consultant from the Bank Street College of Education; and members of our research team. The variables and specific items selected by our panel of experts represents their consensus of the characteristics of an infant day care program which they would look at in judging the quality of the program.

The items were then pre-tested extensively in field by pairs of Observers to see how reliably the items could be coded. It is important to keep in mind that our Field Team Observers were college educated women with B.A. degrees in psychology, early childhood education, or one of the other social sciences. They were not child development or early childhood education experts. Therefore, the items had to be geared to the capabilities of our Field Team Observers. Over a period of approxiately 6 months pairs of Observers tested the instruments and items in the field four days a week, and met weekly with senior members of the research staff to discuss problems. Items which could not be reliably coded were modified or dropped, and new items were added. Once a reliable pool of items was selected, more formal observer reliability studies were undertaken. We also developed a comprehensive manual for all of the instruments used in coding the naturalistic observations.

The data collected on children's psychological experiences in infant day care consisted of literally hundreds of items. In order to reduce the sheer number of variables to be statistically analyzed, it was necessary to combine items from all of our measures in various ways. At the same time, we did not want to limit ourselves to dealing with this data only in a global abstract way, since we obtained a great deal of specific information about children's psychological experiences in infant day care which may be useful in improving these programs in the future. Therefore, we decided to analyze the program data on different levels, which vary in degree of specificity.

For the most molar level of analysis, we have constructed a relatively small number of global indices, which were computed on the basis of all of the data collected during the all-day naturalistic observations. The indices characterize children's psychological experiences within each of the three major program components: (A) Physical Environment; (B) Caregiver(s)' Behavior with Child: and (C) Child's Behavior.

For Physical Environment we computed the following two indices:

I. Physical Stimulation Index

Higher scores on this index would be characterized by an infant day care environment in which there were an ample number and variety of age-appropriate play materials and equipment, adequate play space, toilet facilities, ventilation, lighting, and cleanliness.

II. Physical Freedom-Restriction Index

Children with higher scores on this index were allowed geeater physical freedom to explore the environment. They spent more time on the floor and less time confined in a crib, highchair, or playpen.

For Caregiver(s)' Behavior with Child we have computed the following four indices:

III. Caregiver-Child Ratio

Higher scores on this measure reflected more favorable caregiver-child ratios -- i.e. fewer children per caregiver.

IV. Social Interaction Index

Whereas the previous measure reflected the caregiver-child ratio during the time the sample child was observed, the present index reflected the actual amount and types of social interaction in which the child was involved. Higher scores on this index indicated that the child had more social interaction with people, in general, more one-to-one than group interaction with caregivers, and more interaction with caregivers than with peers.

V. Index of Cognitive-Language Stimulation Provided by Caregiver(s)' to Child

Children with higher scores on this index received more positive social stimulation from caregivers, including more affection and comforting when it was needed; and caregivers tended to use more positive than negative reinforcement and control techniques with children.

For the Child's Behavior we computed the following two indices:

VII. Index of Child's Cognitive-Language Behavior

Children with higher scores on this index vocalized more, used intelligible speech, asked and answered questions, showed a high degree of interest and enjoyment in learning activities, showed more curiosity and exploratory, goal-directed behavior.

VIII. Index of Child's Social-Emotional Behavior

Children with higher scores on this index were generally happier, interacted more often and more positively with both adults and peers.

In addition to the foregoing eight indices, which were based on the naturalistic observation data collected throughout the day, we also computed separate sub-indices based on observations made during the noon meal. The items contained in the noon meal indices represent a sub-set of the all-day indices. We decided to focus on the noon meal on the assumption that it might provide more sensitive measures of the quality of caregiver-child interactions during an important standard child-care situation. We computed the following three noon meal indices:

I. Index of Social Interaction During Noon Meal

Children with higher scores on this index interacted more frequently with caregivers and more often on a one-to-one basis than as part of a group during the noon meal.

II. Index of Social-Emotional Stimulation Provided by Caregiver(s) to Child During Noon Meal

Children with higher scores on this measure received more positive socio-emotional stimulation from caregivers, who communicated more with children, were more sensitive and responsive to children's needs, encouraged children to feed themselves, enjoyed their caregiving role and, in general, created a positive emotional atmosphere during the noon meal.

III. Index of Child's Social-Emotional Behavior During Noon Meal

Children with higher scores on this index manifested more positive socio-affective behavior during the noon meal. They attempted to feed themselves to the extent they were capable, concentrated more on eating and enjoyed their meal.

In the future, we plan to analyze the foregoing naturalistic observation data in a more molecular form, which will provide more specific, quantitative ecological data on children's psychological experiences in infant day care. For example, from Core we can compute the frequency of children's interactions with caregivers on a one-to-one versus a group basis; the frequency of peer interactions; how often caregivers engage children in direct teaching activities, as well as the nature of these teaching activities; how often caregivers attempt to control children's behavior, whether they use predominantly positive or negative reinforcement or control techniques, how often caregivers speak to children; how much time children spend in goal-directed activities versus "doing nothing"; whether children are predominantly happy or unhappy, etc.

The indices based on the naturalistic observation data collected at 12, 18 and 24 months of age were analyzed in two ways: (1) Cross-Sectionally; and (2) Longitudinally.

For the Cross-Sectional analyses, the eight all-day indices and three noon meal indices described above were studied as a function of (1) type of infant day care program (Group versus Family Day Care); and (2) length of time children were in the program. The foregoing analyses were computed separately for the 12, 18 and 24 month indices.

For the Longitudinal analyses, we computed correlations between each of the 12, 18, and 24 month indices with the following six 36-month psychological outcome measures; (1) Stanford-Binet IQ scores; (2) Language Competence; (3) Cognitive Style; (4) Social Competence with Adults; (5) Social Competence with Peers; and (6) Adequacy of Emtional Functioning. The 36-month psychological outcome measures were described in greater detail in Chapter 9. When computing the foregoing correlations, we controlled for type of day care program.

In computing correlations between each of the 12, 18, and 24 month indices and each of the six 36-month psychological outcome measures, we used the following procedure; the 24 month index scores were inserted into the regression equation first, the 18 month index scores second, and the 12 month index scores last. We did this on the assumption, which in general proved to be correct, that the nost recent psychological experiences were likely to correlate more highly than early experiences with the 36-month psychological outcome measures. By inserting the psychological index scores into the regression equation in order of recency, we partialled out or removed the effect of the more recent experiences, when studying the relationships between earlier experiences and children's psychological development at 36 months of age.

In other words, the purpose of the above procedure was to see whether the earlier psychological experiences contributed to children's psychological development at three years of age above and beyond their later experiences. More specifically, did children's experiences at 18 months contribute to their development at 36 months above and beyond their experiences at 24 months of age? Did children's experiences at 12 months contribute to their development at 36 months above and beyond their experiences at 18 and 24 months of age?

This procedure did not eliminate the possibility of finding significant relationships between children's experiences at 12 or 18 months of age and their development at 36 months, if the earlier experiences made an independent contribution to children's development at three years of age. In fact, in a few cases we found no significant relationships between particular 24 month indices and the 36 month measures, but found significant relationships for the 12 or 18 month indices.

For indices which did not correlate at any age with a particular 36 month psychological outcome measure, we combined the 12, 18, and 24 month index scores to see if these combined scores correlated significantly with the 36 month measure.

Results

The results for the eight All-Day and three Noon-Meal indices were as follows:

All-Day Indices

I. Physical Stimulation Index

Children in Group Day Care obtained significantly higher scores on this measure than Family Day Care children at 12 months ($pr = .514$, $t_{188} = 8.22$, $P \leq .01$) 18 months ($pr = .533$, $t_{290} = 10.72$, $P \leq .01$) and 24 months of age ($pr = .745$, $t_{212} = 16.27$, $P \leq .01$).

However, Physical Stimulation at any age did not relate to any of the 36 month psychological measures.

II. Physical Freedom-Restriction Index

Children in Group and Family Day Care did not differ significantly on this measure at any age.

Physical Freedom-Restriction at any age did not relate to any of the 36 month psychological measures.

III. Caregiver-Child Ratio

The Caregiver-Child Ratio was significantly greater for the Family Day Care than the Group Day Care children at 18 months ($pr = -.164$, $t_{288} = -2.82$, $P \leq .01$) and 24 months of age ($pr = -.380$, $t_{212} = -5.97$, $P \leq .01$).

However, the Caregiver-Child Ratio at any age did not relate to any of the 36-month psychological measures.

IV. Social Interaction Index

Children in Family Day Care obtained significantly higher scores on this measure than Group Day Care children at 18 months ($pr = -.276$, $t_{290} = -4.88$, $P \leq .01$) and 24 months of age ($pr = -.310$, $t_{212} = -4.76$, $P \leq .01$).

Social Interaction at 24 months correlated significantly with Social Competence with Adults at three years of age ($pr = .217$, $t_{167} = 2.87$, $P \leq .01$).

V. Index of Cognitive-Language Stimulation Provided by Caregiver(s) to Child

Children in Group and Family Day Care did not differ significantly on this measure at any age.

However, Cognitive-Language Stimulation at 24 months crrelated significantly with Language Competence ($pr = .230$, $t_{167} = 3.05$, $P \leq .01$) and Social Competence with Adults at three years of age ($pr = .236$, $t_{167} = 3.13$, $P \leq .01$).

VI. Index of Social-Emotional Stimulation Provided by Caregiver(s) to Child

Children in Group and Family Day Care did not differ significantly on this measure at any age.

However, Social-Emotional Stimulation at 24 months correlated signifiaantly with Language Competence ($pr = .344$, $t_{167} = 4.74$, $P \leq .01$), Social Competence with Adults ($pr = .284$, $t_{167} = 3.83$, $P \leq .01$) and Adequacy of Emotional Functioning at three years of age ($pr = .267$, $t_{167} = 3.58$, $P \leq .01$).

VII. Index of Child's Cognitive-Language Behavior

Family Day Care children obtained significantly higher scores on this measure at12 months of age ($pr = -.233$, $t_{188} = 3.28$, $P \leq .01$), but did not differ at 18 and 24 months of age.

However, Cognitive-Language Behavior at any age did not relate significantly to any of the 36-month psychological measures.

VIII. Index of Child's Social-Emotional Behavior

Children in Group and Family Day Care did not differ significantly on this measure at any age.

However, Social-Emotional Behavior at 24 months correlated significantly with Language Competence (pr = .233, t_{167} = 3.10, $P \leq .01$), Social Competence with Adults (pr = .261, t_{167} = 3.49, $P \leq .01$), and Adequacy of Emotional Functioning at three years of age (pr = .212, t_{167} = 2.80, $P \leq .01$).

Noon-Meal Indices

I. Index of Social Interaction During Noon Meal

Family Day Care children obtained significantly higher scores on this measure than Group Day Care children at 12 months (pr = -.329, t_{183} = -4.71, $P \leq .01$), 18 months (pr = -.276, t_{290} = -4.88, $P \leq .01$), and 24 months of age (pr = -.310, t_{212} = -4.76, $P \leq .01$).

However, Social Interaction during the noon meal at any age did not relate to any of the 36-month psychological measures.

II. Index of Social-Emotional Stimulation Provided by Caregiver(s) to Child During Noon Meal

Children in Family Day Care obtained significantly higher scores on this measure than Group Day Care children at 18 months (pr = -.375, t_{288} = -6.86, $P \leq .01$) and 24 months of age (pr = -.430, t_{212} = -6.93, $P \leq .01$). Children in Family Day Care who entered the program later were provided with more positive Social-Emotional Stimulation by caregivers during the noon meal than children who entered the program earlier, while the opposite was the case for the Group Day Care children.

However, Social Emotional Stimulation during the noon meal did not relate to any of the 36-month psychological measures.

III. Index of Child's Social-Emotional Behavior During Noon Meal

Children in Group and Family Day Care did not differ significantly on this measure at any age.

Children's scores on this measure at any age did not relate to any of the 36-month psychological measures.

There are three further general findings to report:

1. The length of time children were in the program when they were observed at 12, 18 and 24 months of age was not related to either the caregiver(s)' behavior with children or children's behavior.

2. Children's psychological experiences in day care were consistently related to three aspects of their later psychological development at three years of age: Language Competence, Social Competence with Adults, and Adequacy of Emotional Functioning. The 36-month Stanford-Binet, Peabody Vocabulary, Cognitive Style, and Social Competence with Peers scores did not relate to any aspects of children's earlier psychological experience in day care.

3. While the 24-month psychological experience indices consistently correlated with the 36-month psychological measures, very few of the 12 or 18 month indices were related to children's psychological development at three years of age. Therefore, combining the 12, 18 and 24 month indices did not result in any additional significant correlations with the 36-month psychological measures.

Discussion

The Group Day Care programs were superior to the Family Day Care programs in the amount of play materials, equipment, and space available to children, but differences in the physical aspects of the day care environment were not related to any aspect of children's later psychological development at three years of age.

On the other hand, the Family Day Care programs were superior to the Group Day Care programs in some important social aspects of the programs. The Family Day Care programs were superior to the Group Day Care programs in the caregiver-child ratio, in the amount of social interaction and individual attention children receive from caregivers, and in the degree of positive social-emotional stimulation provided by caregivers to children during the noon meal.

However, of the variables in which the Family Day Care programs were superior to the Group Day Care programs, only the amount of social interaction and individual attention were related to children's later psychological development at three years of age.

The caregiver-child ratio is considered to be an important factor in assessing the quality of an infant day care program. The fact that differences in the caregiver-child ratio were not related to any aspect of children's later psychological development does not mean that it is not important. While the caregiver-child ratio was significantly higher in Family than in Group Day Care, the overall ratio of caregiving adults to the number of children was fairly high. The average caregiver-child ratio in both programs combined was one caregiving adult for every two children. These ratios were somewhat greater than the actual ratios of caregivers to children in these programs, since we counted only the children who were present and awake during the observation periods when these estimates were made. In order to assess the effects of caregiver-child ratio on children's psychological development, infant day care programs which differ greatly in this respect must be studied. Since the programs in the study were publically-funded and licensed, they were required to meet certain minimal standards in terms of caregiver-child ratio, which we had discussed in Chapter 3. The actual ratios we observed were even more favorable than were required, which resulted in very little variability in this respect, which of course would decrease the chances of finding significant correlations between caregiver-child ratios with measures of children's later psychological development.

While there were quantitative differences in the social aspects of the two programs, favoring the Family over the Group Day Care programs (viz.

in the amount of social interaction and individual attention children experienced), the two programs did not differ sgnificantly in the qualitative aspects of the caregivers' or childrens' behavior. That is, the two programs did not differ in the aount of cognitive-language stimulation or positive social-emotional stimulation provided by caregivers to children, nor were there any significant differences in the children's behavior in these respects, with one exception: at 12 months of age the children in Family Day Care obtained significantly higher cognitive-language scores than those in Group Day Care.

While the children in Group and Family Day Care did not differ in the cognitive-language stimulation they received from caregivers at 12, 18 or 24 months of age, at three years of age the Group Day Care children obtained significantly higher Stanford-Binet scores than the Family Day Care children. Since there were no significant differences in the amount of cognitive-language stimulation provided to children in Group and Family Day Care, and since their 36-month Binet scores were not related to any aspect of their earlier psychological experience, which we had evaluated, the IQ differences between children in the two programs at three years of age remains unexplained. It is possible when we scrutinize our program variables on a more molecular level, we may find differences between the Group and Family Day Care programs in the amount of direct teaching, for example, which may be related to later IQ differences. It is also possible that the Group and Family Day Care programs did not differ in the amount of cognitive-language stimulation children received during the first two years of life, but the programs may have differed in this respect during the third year of life, which may account for the IQ difference at three years of age. However, such possible program differences between 24 and 36 months of age could not be detected, since we did not study the programs after two years of age. In future studies, Group and Family Day Care programs should be compared during the third year of life to see if the programs differ in the amount of cognitive-language stimulation provided to children.

Although there were essentially no qualitative differences between the Group and Family Day Care programs, except during the noon meal, individual differences in the behavior of caregivers and children in day care were related to important aspects of children's later psychological development at three years of age: vis their language competence, social competence with adults, and adequacy of emotional functioning.

On the basis of the results of the present study, we can conclude:

1. The physical aspects of the infant day care environment, such as play materials, equipment, and space, are less important for childrens' later psychological development than the social aspects of the program.

2. The amount of social interaction and individual attention which children receive during the first two years of life are important for their later psychological development.

3. The quality of caregiving which children receive during the first two years of life is more important for their later psychological development than whether such care is provided in a day care center or Family Day Care home.

CHAPTER 11 - THE IMPACT OF INFANT DAY CARE ON FAMILIES

While relatively little is known about the effects of public service-oriented Group and Family Infant Day Care programs on children, we know even less about the impact of these programs on the family.

Public infant day care programs in New York City primarily serve low-income and welfare families with children from 2 months to three years of age. The basic purpose of these programs is to help such families move up the socio-economic ladder, by allowing mothers with babies to complete their education, obtain job training, or work. In planning these programs, particular emphasis was placed on helping welfare families to become self-supporting, by making it possible for mothers with infants to work and earn money.

However, concern has been expressed about the potentially adverse effects of infant day care programs on the family. When mothers with infants take employment outside of the home or return to school, the roles and responsibilites of various members of the family may change radically. Such changes may disturb the equilibrium of the family and disrupt its functioning in various ways. On the other hand, Infant Day Care programs may not only help families to adapt to such changes but also improve family functioning in some respects.

Infant Day Care programs may differ in the extent to which they help families to achieve their socio-economic goals, adapt to changes in the families' circumstances, and improve its functioning. The length of time that families have been in the program may also make a difference in these respects.

The study was designed to assess the effects of the type of Infant Day Care program and length of time in the program on families in the following respects: (1) Socio-economic status; (2) Economic resources; (3) Family structure; and (4) Family functioning.

Method

Data on the Longitudinal Group and Family Day Care families were obtained on the basis of comprehensive, in-depth interviews with all adult members of the immediate family on two occasions: (1) when the sample child first entered an Infant Day Care program; and (2) when the child was approximately three years of age. These two essentially identical interviews are referred to as the Entry and Final Interviews. The Thirty-Six Month Cross-Sectional families only received the Entry Interview, when the child first entered a day care program about three years of age.

Before the interviwers visited the families in the study they were trained extensively in our offices. Potential interviewers were asked to conduct mock interviews with members of the family development research staff to determine their suitability for the position. These interviews were checked and processed as though they were actual family development data. Training interviews were also conducted before the study began with a small sample of pilot families who did not participate in the study. Shortly after the first longitudinal families were interviewed an Interviewer Manual was written; subsequently, detailed instructions for collecting, coding, and rating data were also written. The manuals and instructions were submitted in previous progress reports. We used only female family interviewers, most of whom were college graduates, fluent in both English and Spanish. Hispanic families were interviewed by these bilingual interviewers in the language a family member was most comfortable speaking.

The interviews were scheduled at the family's convenience, generally in the evenings and on weekends. The Entry Interview usually required two separate visits to complete. The Final Interview required only one visit, since it focused on changes which had occurred in the family since the first interview. On the basis of the information obtained from the family interviews, the following measures were used to assess family development:

1. Hollingshead Two-Factor Index of Social Position

The Index of Social Position (Hollingshead, 1965) score for a family is usually based on the occupation and education of the head of the household, which in two-parent nuclear families is usually the father. A combined score is derived from the separate weighted occupation and education scores. Index scores can range from 11 to 77. The lower the score, the higher the family's socio-economic status. Hollingshead also assigns families into one of five social classes on the basis of the Index scores, with I as the highest class and V as the lowest class.

In this study the family's socio-economic statss was based on the occupation and education of all adult members of the immediate family, since we expected that a number of the families in the study would not be two-parent nuclear families. This was done by computing separate index scores for each adult member of the family residing in the home, summing the scores and dividing by the number of adults in the family. We used this procedure for both extended and nuclear two-parent families. In the case of single adult families, the Index score was, of course, computed on the basis of one adult's occupation and education.

2. Total Annual Rate of Family Income

The total annual rate of family income was computed on the basis of the combined rate of income of all members of the immediate family, regardless of the source(s) of income (i.e. wages, public assistance, alimony, child support, etc.). This figure was not based on the family's actual income during the preceding year, but on the rate of income during the month it was reported. For example, the annual rate of income before entry into day care was computed on the basis of the family's total income during the month before the child entered the program.

3. Annual Rate of Income from Wages Only (Excluding income from other sources, such as public assistance, stipends, etc.)

4. Source(s) of Income

The family was assigned to one of the following three categories, in terms of source(s) of income:

(a) 100% wages, if the family was completely self-supporting (i.e. if all of the family's income came from wages);

(b) Mixed, if the family's income was derived from both wages and other sources, such as supplimental public assistance, student or job trainee stipneds, alimony, child support, etc.

(c) No Wages, if none of the family's income was derived from wages.

5. St. Paul Profile of Family Functioning

The St. Paul Profile of Family Functioning was developed by Geismar and Ayers (1960), and was modified for this study. It was originally developed as a tool for diagnosing the functioning of multi-problem families and for quantitatively assessing changes or improvements in family functioning as a result of family-centered casework intervention. Subsequently, the Profile was validated on an heterogeneous population, varying in income level (Geismar and La Sorte, 1964); and, of particular relevance to the present study, a large sample of low-income Black and Puerto Rican families in the Northeastern United States (Geismar and Krisberg, 1967).

The modified St. Paul Profile assesses the following 9 major categories of family functioning: (I) Family Relationships and Unity; (II) Individual Behavior and Adjustment; (III) Care and Training of Children; (IV) Social Activities; (V) Economic Practices; (VI) Home and Household Practices; (VII) Health Conditions and Practices; (VIII) Relationships to Infant Day Care Program Staff; and (IX) Use of Community Resources.

The nine major categories include 28 subcategories; each of the 28 subcategories may be analyzed separately. The nine major and 28 subcategories are listed in Table 11-1.

The St. Paul was modified for use in the present study in the following ways: Category (VIII) was originally concerned with the family's Relationship to Social Worker . Through consultation with Dr. Geismar it was replaced by questions which explored the family's Relationship to Infant Day Care Program Staff. Category (III), Care and Training of Children was expanded to include more questions about infant care practices at home.

The following steps were involved in obtaining and rating data for the St. Paul Profile of Family Functioning:

1. All adult members of the family who lived in the same household as the sample child were interviewed. Interviewers were matched with families whenever possible, in terms of ethnicity and language usage. Bilingual (English-Spanish speaking) interviewers were always sent to Hispanic

families. The family interviewers were all females. We had tried to use male interviewers, but found that they were less acceptable than females to both parents, particularly in Puerto Rican families. Each member of the family was interviewed individually and privately, at a time when it was most convenient for him or her. Since parents in most of the families in the study worked during the day, most interviews were conducted in the evening or on weekends. The Entry Interview usually required about 2 to 3 hours to complete, on two separate visits to the home.

Each adult member of the family was asked a series of open-ended questions which were designed to obtain information in each major category and subcategory. Tape recorders were used by the family interviewers to facilitate the collection of this data, but only if permission was granted by the person being interviewed.

Once all of the family members were interviewed, the family interviewer prepared a written report, which contained only concrete objective information about each category and subcategory of family functioning, as free as possible of value judgements.

2. Before the written protocols were submitted to raters, they were screened by the Family Interviewer Supervisor to make sure they were complete. If the protocols were incomplete or unclear in any one category, the interviewer was asked to rewrite that section of the protocol from the interview tape, or by contacting the family again.

3. Every completed written protocol was rated independently by at least two trained raters using criteria in the Guideline for Rating Levels of Social Functioning (Geismar and Ayers, 1960), which contained revisions appropriate to this study. The ratings for each category and sub-category can range from Inadequate to Adequate on a seven-point scale, with 1 designated as Inadequate, 4 as Marginal and 7 as Adequate. The rating staff rated each subcategory of a major category (e.g. Family Relationships and Unity). Then on the basis of the numerical mean of the subcategories and their judgements of the overall functional level, a score was assigned to the category. This procedure was followed for each of the nine categories. The total score for a family was arrived at by summing the separate category ratings and dividing by nine. When the total score for two independent ratings were different, the disagreements were resolved by consensus between the pair of raters, or by a third person who, again rated the protocol independently.

In assessing family functioning, the following measures were used: (a) a single composite Total St. Paul Score, which was derived by computing a mean or average of the 9 separate category scores; and (b) nine separate scores, representing each major category.

During the Entry Interview, the following additional demographic information was obtained:

1. Sample Child's Ethnicity

Sample children were assigned to one of the following four ethnic categories:

(a) Black-English speaking, which included both American blacks and English speaking blacks from other places, such as the Caribbean.

(b) Hispanic, which largely consisted of Puerto Rican children, but also included children from other Spanish speaking ethnic groups;

(c) English speaking other, which largely consisted of white English speaking children; and

(d) Multi-lingual other, which included children whose parents spoke to them in another language (with or without English) such as French, Chinese, Hebrew, etc.

2. Family Structure

(a) Nuclear Family I These consisted of two-parent families where the mother and father (or other adult male) lived together legally or in common law in their own or another's household.

(b) Nuclear Family II This category included mothers and child(ren) living alone, but with an adult male model or father figure often present in the home during the course of the study; the adult male may or may not have been the child(ren's) biological father.

(c) Single-Parent Family These consisted of families in which the mother lived alone with her child(ren); neither she nor the child(ren) were visited by the father, husband, or any other adult male.

(d) Extended Family These were families where the mother and child(ren) lived with the infant's grandparents or other relatives.

Family structure in the longitudinal samples was examined to determine whether there were any changes that might have resulted from a family's participation in the infant day care programs.

3. Siblings

Information was obtained about the number and ages of preschool and school age siblings living in the home. The siblings were grouped into those from (a) 0 to 5 years; (b) 6 to 17 years; and (c) over 17 years of age.

4. Mother's Age When Sample Child Was Born

Family development was assessed at the following three key points in time for the longitudinal samples:

1. Month Before Child Entered Day Care Program

On the basis of the Entry Interviews, we were able to determine the the family's socio-economic status, income, sources of income, functioning, and structure during the month before the child entered the program. These served as baseline measures before the day care service may have had an impact on the family.

2. Month After Child Entered Day Care Program

On the basis of the Entry Interviews, we were also able to determine changes which had occurred in the family's socio-economic status, income, sources of income, and structure soon after the child entered the day care program. These measures made it possible to assess the immediate impact of the day care service on the families. While we obtained baseline measures on various aspects of family functioning on the St. Paul Profile, we did not assess immediate changes in these aspects of family functioning.

3. When Child Was Three Years of Age

From the data collected at the Final Interview, we were able to determine changes in the family's socio-economic status, income, sources of income, family functioning, and structure which occurred from the time the child first entered the day care program, from 2 to 21 months of age, to the time the child was three years of age. These measures allowed us to assess the long-term impact of the day care service on families, which included changes in family functioning, as measured by the St. Paul Profile.

Since the families in the Thirty-Six Month Cross-Sectional sample were only interviewed once, when the child was three years of age, we were only able to obtain baseline measures and to assess the immediate impact of day care on these families.

The impact of the infant day care programs on families was assessed on the basis of six measures, (1) Hollingshead Two-Factor Index of Social Position; (a) Total Annual Rate of Income; (3) Rate of Income from Wages; (4) Source(s) of Income; (5) Family Structure; and (6) Total St. Paul Profile of Family Functioning score. In addition, we also assessed changes in the nine major categories of family functioning, in order to see whether there were any changes in certain specific areas.

Results

Prior to analyzing the effects of infant day care on the families' Socio-Economic Status, Economic Resources, Structure, and Functioning, it was necessary to determine whether the samples to be compared differed in these respects before they entered the program, so that any initial differences could be statistically controlled.

The three 18-month samples differed initially only in Sources of Income ($R = .20$, $F_{2,250} = 5.21$, $P \leq .01$). Eighty percent of the Family Day Care, 69% of the Group Day Care, and 56% of the Cross-Sectional families were totally self-supporting before they entered the program.

The three 36-month samples also differed initially only in Sources of Income ($R = .283$, $F_{2,211} = 9.17$, $P \leq .01$). Eighty-one percent of the Family Day Care, 63% of the Group Day Care and 50% of the Cross-Sectional families were totally self-supporting before they entered the program.

In terms of results, there were no significant differences among the three 18-month samples in the *immediate effects* of the program (i.e. after the children were in the program for about a month) on the families' Socio-Economic Status, Total Income, Income from Wages, Sources of Income, or Family Structure. While there were increases on some of the measures, they were not related to the type of day care program or the age when the children entered the program.

The results for the *long-term effects* of infant day care on the families were similar. The 36-month Longitudinal Group and Family Day Care samples were compared in terms of Socio-Economic Status, Economic Resources, Structure, and Total Functioning when the children were about three years of age, controlling for initial differences. While there were increases on some of the measures over a period of several years, they were not related to the type of day care program or length of time in the program.

The pattern of differences among the three samples when children were 36 months of age was almost identical to the initial differences among them described earlier. The Longitudinal families, who had been in a day care program for several years, did not differ significantly from the Cross-Sectional families, who were only in the program for about one month, in terms of Socio-Economic Status, Total Income, Income from Wages, Sources of Income, Family Structure, or Total Family Functioning.

There may have been a ceiling effect operating on the St. Paul Profile, reducing the possibility of significant differences in improvement in family functioning from emerging among various samples. For example, the initial Mean Total St. Paul scores for the three 36-month samples was approximately 6.7 out of a maximum score of 7.0. However, the three samples did not differ significantly on other measures -- such as the Hollingshead, Total Income, Income from Wages, etc. -- where there was ample room for improvement.

The family development data are presented in Tables 11-1 through 11-17.

Discussion

On the basis of the present study, it is our impression that families *use* public infant day care services, much as they use other community resources for their children, such as schools, but they may not be greatly affected by these programs, in terms of socio-economic status, economic resources, structure or functioning.

It did not seem to make any substantial difference on any of the six family development variables we studied whether the family had used a Group or Family Infant Day Care service, or how long the family had been using the service.

A significantly higher proportion of families who cared for their children at home during the first three years of life and first placed them into a day care program at this age were on public assistance. But this did not significantly lower the families' income. Public assistance may have made it possible for these mothers to remain at home with their children for the first few years of life, which was the original purpose of the Federal Aid to Dependent Children (ADC) program. But it is important to keep in mind that these families did not differ significantly from these that had been using an infant day care service for several years, in terms of their socio-economic status, total income, income from wages, structure, or functioning.

The children who are eligible for public infant day care programs in New York City tend to come from low-income or welfare families. Approximately 70% of the Longitudinal families in the study were totally self-supporting before they entered an infant day xare program. Fourteen percent of the families were completely dependent on public assistance before they entered the program. After the families had been in the program for several years, 14% of them were still totally dependent on public assistance. While public day care programs in NYC generally require that the mothers work or at least seek employment in order to remain in the program, a relatively small proportion of children whose mothers are unable to work for various reasons and cannot care for their children are accepted into the program. Such families may remain dependent on public assistance as long as the children are in the program. This may explain why the proportion of families totally dependent on welfare did not change over a period of several years. The important point to keep in mind, however, is that most of the Longitudinal families in the study were self-sufficient before they entered the program and remained so for as long as we studied them.

As we had reported earlier, we interviewed 1,366 families who had applied for public day care services in NYC in August, 1976, to find out about children's previous child care experience. Approximately 70% of the children, who ranged from a few months to 7 years of age, had been placed for private child care outside of their homes before 2½ years of age, while their mothers were working or going to school. Seventy-five percent of these children had been placed for care outside of the home during the first year of life, and half of these were placed during the first six months. Obviously the mothers did not wait for their children to be accepted into a public infant day care program before going to work. They made their own child care arrangements, which were often inadequate and costly. Private child care here generally costs a family $25-$30 a week for one child, which is considerably more than the $2 a week that most families in public day care programs were paying.

It is our impression that public infant day care services in New York City are used by relatively intact, fairly well functioning, poor working families. They work even though they may not earn much more than they would get from public assistance. They work whether public infant day care services are available for their children or not. This picture of poor working Black and Hispanic families runs counter to the stereotypes one often reads in the literature about disorganized, minority welfare families

(Clark, 1965; Gans, 1964; Glazer and Moynihan, 1965; Moynihan, 1965).

While the infant day care programs did not seem to greatly affect the families on the variables we studied, the families may have benefited from such programs in certain important respects which we did not measure: at the very least, the programs provided families with reliable, supervised, low-cost child care for their babies, who were not adversely affected by their experience in infant day care and who may have benefited in some important respects.

Table 11-1

Categories and Subcategories of the Profile of Family Functioning

I. FAMILY RELATIONSHIPS AND UNITY

1. Marital/Post Conceptual Relations
2. Parent-Child Relationships
3. Sibling Relationships
4. Family Solidarity
5. Relations with Other Household Members

II. INDIVIDUAL BEHAVIOR

6. Mother
7. Father
8. Older Children (10 and Up)
9. Younger Children (1-9)

III. CARE AND TRAINING OF CHILDREN

10. Physical Care
11. Training Methods

IV. SOCIAL ACTIVITIES

12. Informal Associations
13. Formal Associations

V. ECONOMIC PRACTICES

14. Source of Income
15. Job Situation
16. Training
17. Use of Money

VI. HOME AND HOUSEHOLD PRACTICES

18. Physical Facilities
19. Housekeeping Standards

VII. HEALTH CONDITIONS AND PRACTICES

20. Health Problems and Conditions
21. Health Practices

VIII. RELATIONSHIP TO PROGRAM STAFF

22. Attitude Toward Caregivers
23. Use of Program Staff

IX. USE OF COMMUNITY RESOURCES

24. School
25. Church
26. Health Resources
27. Social Agencies
28. Recreational Agencies

Table 11-2

Sources of Income of Eighteen Month Sample Families Before and Immediately After Entry Into Day Care Programs

SAMPLE	SOURCES OF INCOME BEFORE				SOURCES OF INCOME AFTER			
	No Wages	Mixed	100% Wages	TOTAL	No Wages	Mixed	100% Wages	TOTAL
Eighteen-Month Longitudinal Group Day Care	(16) 18.8%	(10) 11.8%	(59) 69.4%	(85) 100%	(17) 19.5%	(14) 16.1%	(56) 64.4%	(87) 100%
Eighteen-Month Longitudinal Family Day Care	(11) 9.7%	(11) 9.7%	(91) 80.6%	(113) 100%	(6) 5.4%	(12) 10.7%	(94) 83.9%	(112) 100%
Eighteen Month Cross-Sectional	(13) 23.6%	(11) 20.0%	(31) 56.4%	(55) 100%	(9) 16.7%	(11) 20.4%	(34) 62.9%	(54) 100%
TOTAL	(40) 15.8%	(32) 12.7%	(181) 71.5%	(253) 100%	(32) 12.7%	(37) 14.6%	(184) 72.7%	(253) 100%

Table 11-3

Sources of Income of Thirty Six Month Sample Families Before and After Entry Into Day Care Programs and at the 36 Month Final Interview

SAMPLE	SOURCES OF INCOME BEFORE				SOURCES OF INCOME AFTER				SOURCES OF INCOME AT 36 MONTHS			
	No Wages	Mixed	100% Wages	TOTAL	No Wages	Mixed	100% Wages	TOTAL	No Wages	Mixed	100% Wages	TOTAL
Thirty Six Month Longitudinal Group Day Care	(14) 19.2%	(13) 17.8%	(46) 63.0%	(73) 100%	(15) 20.3%	(12) 16.2%	(47) 63.5%	(74) 100%	(12) 18.2%	(8) 12.1%	(46) 71.9%	(66) 100%
Thirty Six Month Longitudinal Family Day Care	(7) 8.9%	(8) 10.1%	(64) 81.0%	(79) 100%	(2) 2.6%	(11) 14.5%	(63) 82.9%	(76) 100%	(7) 9.7%	(5) 6.9%	(60) 83.4%	(72) 100%
Thirty Six Month Cross-Sectional	(21) 33.9%	(10) 16.1%	(31) 50.0%	(62)	(17) 27.4%	(13) 21.0%	(32) 51.6%	(62) 100%				
TOTAL	(42) 19.6%	(31) 14.5%	(141) 65.9%	(214) 100%	(34) 16.0%	(36) 17.0%	(142) 67.0%	(212) 100%	(19) 13.9%	(13) 9.6%	(106) 87.5%	(138) 100%

Table 11-4

Rate of Income From Wages and Total Income Rate Before and Immediately After Entry Into Day Care Programs for Eighteen Month Sample Families

WAGES

SAMPLE	N	Before Entry Into Program	After Entry Into Program	Difference
Eighteen-Month Longitudinal Group Day Care	86	$6,014	$6,908	$ 894
Eighteen-Month Longitudinal Family Day Care	115	7,111	8,240	1,129
Eighteen-Month Cross-Sectional	56	5,513	6,262	749

TOTAL INCOME

SAMPLE	N	Before Entry Into Program	After Entry Into Program	Difference
Eighteen-Month Longitudinal Group Day Care	86	$6,868	$7,830	$ 962
Eighteen-Month Longitudinal Family Day Care	114	7,691	8,713	1,022
Eighteen-Month Cross-Sectional	56	6,888	7,431	543

Table 11-5

Rate of Income From Wages and Total Income Rate for Thirty-Six Month Samples Families Before and After Entry Into Day Care Programs and At the 36 Month Final Interview

MEAN INCOME FROM WAGES

SAMPLE	N	Before Entry Into Program	After Entry Into Program	At 36 Months
Thirty-Six Month Longitudinal Group Day Care	75	$6,094[a]	$6,723	$7,776
Thirty-Six Month Longitudinal Family Day Care	79	6,470[a]	7,747	8,888
Thirty-Six Month Cross-Sectional	65	5,893[b]	6,430	

SAMPLE	N	Before Entry Into Program	After Entry Into Program	At 36 Months
Thirty-Six Month Longitudinal Group Day Care	74	$7,374[a]	$7,946	$8,911
Thirty-Six Month Longitudinal Family Day Care	79	6,971[a]	8,071	9,457
Thirty-Six Month Cross-Sectional	63	8,039[b]	8,371	

a. Rates obtained in 1973-1975

b. Rates obtained in 1976

Table 11-6

Hollingshead's Social Class Position[a] of Families in Eighteen-Month Sample Before Entry into Day Care Program

SAMPLE	SOCIAL CLASS I	II	III	IV	V
Eighteen-Month Longitudinal Group Day Care Sample	(0) 0%	(2) 2.1%	(8) 8.5%	(33) 35.1%	(51) 54.3%
Eighteen-Month Longitudinal Family Day Care Sample	(0) 0%	(1) 0.8%	(11) 8.5%	(47) 36.2%	(71) 54.6%
Eighteen-Month Cross-Sectional Sample	(0) 0%	(3) 5.1%	(3) 5.1%	(26) 44.1%	(27) 45.8%
TOTAL	(0) 0%	(6) 2.1%	(22) 7.8%	(106) 37.5%	(149) 52.7%

N = 283

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a. Based on Hollingshead's Two-Factor Index of Social Position.

Table 11-7

Hollingshead's Social Class Position[a] of Families in Eighteen-Month Sample After Entry Into Day Care Program

	SOCIAL CLASS					
SAMPLE	I	II	III	IV	V	
Eighteen-Month Longitudinal Group Day Care Sample	(0) 0%	(3) 3.2%	(9) 9.6%	(40) 42.6%	(42) 44.7%	
Eighteen-Month Longitudinal Family Day Care Sample	(0) 0%	(3) 2.3%	(10) 7.7%	(50) 38.5%	(67) 51.5%	
Eighteen-Month Cross-Sectional Sample	(0) 0%	(2) 3.4%	(4) 6.8%	(27) 45.8%	(26) 44.1%	
TOTAL	(0) 0%	(8) 2.8%	(23) 8.1%	(117) 41.3%	(135) 47.7%	N = 283

a. Based on Hollingshead's Two-Factor Index of Social Position.

Table 11-8

Hollingshead's Social Class Position[a] of Families in Thirty-Six Month Sample Before Entry Into Day Care Program

SAMPLE	SOCIAL CLASS I	II	III	IV	V	
Thirty-Six Month Longitudinal Group Day Care Sample	(0) 0%	(3) 3.8%	(7) 8.8%	(32) 40.0%	(38) 47.5%	
Thirty-Six Month Longitudinal Family Day Care Sample	(0) 0%	(1) 1.1%	(7) 7.8%	(37) 41.1%	(45) 50.0%	
Thirty-Six Month Cross-Sectional Sample	(0) 0%	(1) 1.5%	(3) 4.5%	(21) 31.3%	(42) 62.7%	
TOTAL	(0) 0%	(5) 2.1%	(17) 7.2%	(90) 38.0%	(125) 52.7%	N = 237

a. Based on Hollingshead's Two-Factor Index of Social Position.

Table 11-9

Hollingshead's Social Class Position[a] of Families in Thirty-Six Month Sample After Entry Into Day Care Program

	SOCIAL CLASS					
SAMPLE	I	II	III	IV	V	
Thirty-Six Month Longitudinal Group Day Care Sample	(0) 0%	(3) 3.8%	(6) 7.5%	(37) 46.3%	(34) 42.5%	
Thirty-Six Month Longitudinal Family Day Care Sample	(0) 0%	(2) 2.2%	(6) 6.7%	(41) 45.6%	(41) 45.6%	
Thirty-Six Month Cross-Sectional Sample	(0) 0%	(1) 1.5%	(3) 4.5%	(22) 32.8%	(41) 61.2%	
TOTAL	(0) 0%	(6) 2.5%	(15) 6.3%	(100) 42.2%	(116) 48.9%	N = 237

a. Based on Hollingshead's Two-Factor Index of Social Position.

Table 11-10

Hollingshead Social Class Position[a] of Families in the Thirty-Six Month Sample at the 36 Month Final Interview

	SOCIAL CLASS				
SAMPLE	I	II	III	IV	V
Thirty-Six Month Longitudinal Group Day Care	(1) 1.3%	(3) 4.0%	(9) 11.8%	(27) 35.5%	(36) 47.4%
Thirty-Six Month Longitudinal Family Day Care	(0) 0%	(3) 4.5%	(8) 11.9%	(24) 35.8%	(32) 47.8%
TOTAL	(1) 0.7%	(6) 4.0%	(17) 12.0%	(51) 35.7%	(68) 47.6%

a. Based on Hollingshead's Two-Factor Index of Social Position.

Table 11-11

Structure of Families in Eighteen-Month Sample Before Entry Into Day Care Program

	FAMILY STRUCTURE				
SAMPLE	Nuclear Family I	Nuclear Family II	Single Parent Family	Extended Family	
Eighteen-Month Longitudinal Group Day Care Sample	(55) 56.7%	(11) 11.3%	(16) 16.5%	(15) 15.5%	
Eighteen-Month Longitudinal Family Day Care Sample	(67) 50.8%	(17) 12.9%	(24) 8.3%	(24) 18.2%	
Eighteen-Month Cross-Sectional Sample	(26) 42.6%	(11) 18.0%	(17) 27.9%	(7) 11.5%	
TOTAL	(148) 51.0%	(39) 13.4%	(57) 19.7%	(46) 15.9%	N = 290

Table 11-12

Structure of Families in Eighteen-Month Sample After Entry Into Day Care Program

	FAMILY STRUCTURE			
SAMPLE	Nuclear Family I	Nuclear Family II	Single Parent Family	Extended Family
Eighteen-Month Longitudinal Group Day Care Sample	(55) 56.7%	(11) 11.3%	(16) 16.5%	(15) 15.5%
Eighteen-Month Longitudinal Family Day Care Sample	(66) 50.0%	(18) 13.6%	(24) 18.2%	(24) 18.2%
Eighteen-Month Cross-Sectional Sample	(26) 42.6%	(11) 18.0%	(17) 27.9%	(7) 11.5%
TOTAL	(147) 50.7%	(40) 13.8%	(57) 19.7%	(46) 15.9%

N = 290

Table 11-13

Structure of Families in Thirty-Six Month Sample Before Entry Into Day Care Program

SAMPLE	FAMILY STRUCTURE Nuclear Family I	Nuclear Family II	Single Parent Family	Extended Family	
Thirty-Six Month Longitudinal Group Day Care Sample	(43) 51.8%	(12) 14.5%	(17) 20.5%	(11) 13.3%	
Thirty-Six Month Longitudinal Family Day Care Sample	(44) 48.4%	(18) 19.8%	(17) 18.7%	(12) 13.2%	
Thirty-Six Month Cross-Sectional Sample	(25) 37.3%	(11) 16.4%	(21) 31.3%	(10) 14.9%	
TOTAL	(112) 46.5%	(41) 17.0%	(55) 22.8%	(33) 13.7%	N = 241

Table 11-14

Structure of Families in Thirty-Six Month Sample After Entry Into Day Care Program

	FAMILY STRUCTURE				
SAMPLE	Nuclear Family I	Nuclear Family II	Single Parent Family	Extended Family	
Thirty-Six Month Longitudinal Group Day Care Sample	(43) 51.8%	(12) 14.5%	(17) 20.5%	(11) 13.3%	
Thirty-Six Month Longitudinal Family Day Care Sample	(43) 47.3%	(19) 20.9%	(17) 18.7%	(12) 13.2%	
Thirty-Six Month Cross-Sectional Sample	(26) 38.8%	(11) 16.4%	(20) 29.9%	(10) 14.9%	
TOTAL	(112) 46.5%	(42) 17.4%	(54) 22.4%	(33) 13.7%	N = 241

Table 11-15

Structure of Families in the Thirty-Six Month Sample at the 36 Month Final Interview

SAMPLE	Nuclear Family I	Nuclear Family II	Single-Parent Family	Extended Family
Thirty-Six Month Longitudinal Group Day Care	(38) 50.0%	(8) 10.5%	(25) 32.9%	(5) 6.6%
Thirty-Six Month Longitudinal Family Day Care	(36) 52.9%	(7) 10.3%	(22) 32.4%	(3) 4.4%
TOTAL	(74) 51.4%	(15) 10.4%	(47) 32.6%	(8) 5.6%

Table 11-16

Total Mean St. Paul Profile of Family Functioning Scores For Eighteen-Month Sample Families at Entry Into Day Care

SAMPLE	N	Mean Profile Score
Eighteen-Month Longitudinal Group Day Care	98	6.75
Eighteen-Month Longitudinal Group Day Care	131	6.82
Eighteen-Month Cross-Sectional	63	6.68

Table 11-17

Total Mean St. Paul Profile of Family Functioning Score for Thirty-Six Month Sample Families at Entry Into Day Care and at Thirty-Six Month Final Interview

SAMPLE	N	Mean Profile Score at Entry	N	Mean Profile Score at 36 Months
Thirty-Six Month Longitudinal Group Day Care	83	6.73	67	6.83
Thirty-Six Month Longitudinal Family Day Care	88	6.77	78	6.75
Thirty-Six Month Cross-Sectional	64	6.70		

CHAPTER 12 - SUMMARY AND CONCLUSIONS

In recent years there have been some studies of infant day care reported in the literature which indicate that children with Group Day Care experience during the first few years of life develop as well and in some cases develop better than comparable children who were cared for at home by their own mothers or in Family Day Care homes (Caldwell, 1970; Heber et al, 1972; Saunders and Keister, 1972; Bronfenbrenner, 1976; Kagan, 1976; Ricciuti, 1976).

However, these studies were based on relatively small numbers of children in a few research-oriented, academically-based, model day care centers, where the infants received a great deal of enrichment. The research usually focused on the effects of infant day care on children's psychological development or on the mother-child relationship, but the impact of day care on children's physical health and growth or on the families have generally not been studied. Furthermore, the infant day care programs themselves were usually not studied to any great extent, which would make it possible to identify aspects of the programs which facilitate children's development.

Group and Family Day Care are the two major alternative methods of providing substitute day care for infants in this country. Briefly, in Group Day Care children are cared for in a day care center, with 8-10 children of approximately the same age in a room, and several caregivers or teachers. In Family Day Care children are cared for in a licensed private home or apartment, with less than six children of various ages in the home, and only one caregiver. While there has been a great deal of interest and controversy over which form of day care is better for babies, there have been few comparative studies of Group and Family Infant Day Care programs reported in the literature. In one of the few comparative studies of Group and Family Day Care, the study was based on a total of 25 children in both types of day care programs (Saunders and Keister, 1972).

In contrast to other studies, the New York Infant Day Care Study was a large-scale, interdisciplinary, longitudinal, comparative study of 31 service-oriented, licensed public and private, community-controlled Group and Family Infant Day Care programs, and their effects on approximately 400 children and their families.

Methods

Children who entered a Group or Family Day Care program between 2 and 21 months of age were longitudinally studied until about three years of age. In addition, children who were cared for at home by their own families during the first 2½-3 years of life and first entered a day care program at this time, when children have traditionally started day care in this country, were cross-sectionally compared to the longitudinal infant day care children on various aspects of development at about three years of age.

Group and Family Infant Day Care programs and their effects were studied in three major areas: (1) Children's Nutrition, Physical Health, and Growth; (2) Children's Psychological Development; and (3) Family

Development, which was concerned with the impact of day care on the families.

The day care programs were also studied, particularly those aspects of the program concerned with the nutrition and health care provided to children, and children's psychological experiences in infant day care. While the Group and Family Day Care programs were compared in these respects, we also studied the relationships between children's individual experiences in infant day care and their subsequent development.

In assessing children's nutrition, physical health, and growth, we used the following procedures. Prenatal and birth records were obtained. Comprehensive pediatric examinations were carried out by physicians on our research staff of each child in the study at about 6, 12, 18 and 36 months of age. This included laboratory tests for anemia, sickle cell, and lead poisoning. The quality of health care provided to children by their day care program was evaluated on the basis of the day care agencies' health records on children. We were particularly concerned with the adequacy of children's immunizations, the day care agency's knowledge of children's medical problems, as well as the follow-up of medical problems which we had reported to Directors. The nutrition provided to children in their day care setting was evaluated on the basis of all-day naturalistic observations of each sample child in his or her day care center or family day care home at about 12, 18 and 24 months of age. These observations were also used to assess physical safety and safety practices by caregivers.

Children's psychological experiences in infant day care were also evaluated on the basis of the all-day naturalistic observations at 12, 18 and 24 months of age. In evaluating children's psychological experiences, we distinguished among the following three important program components: (1) the Physical Environment, which included the play materials, equipment, and space available; (2) the Caregiver(s)' Behavior with Children, which included the Caregiver-Child Ratio, the amount of individual attention children received from caregivers, as well as the cognitive-language and social-emotional stimulation provided to children by caregivers; and (3) Children's Behavior, which included their cognitive-language and social-emotional functioning.

Children's psychological development was evaluated at about 6, 12, 18 and 36 months of age. During the first 18 months, we relied primarily on the Bayley Mental Scale. At three years of age, we employed a more comprehensive battery of assessment procedures, which included: (1) Standard Tests, such as the Stanford-Binet Intelligence Scale and the Peabody Picture Vocabulary Test; (2) a 45-minute Play Interview; and (3) two 45-minute Naturalistic Observations in each child's usual day care setting. The 36-month psychological evaluation required two full mornings to complete for each child in the study. Children's behavior in the foregoing three situations were rated on: (A) Language Competence; (B) Cognitive Style; (C) Social Competence with Adults; (D) Social Competence with Peers (during the Naturalistic Observations if there were peers present); and (E) Adequacy of Emotional Functioning.

Family Development was evaluated on the basis of comprehensive interviews with all adult members of the immediate family on two occasions: (1) when the children first entered the day care program; and (2) when the children were about three years of age. The impact of day care on families was assessed on the following variables: (1) Socio-Economic Status (SES), based on the Hollingshead Two-Factor Index of Social Position; (2) Total Rate of Income; (3) Rate of Income from Wages Only; (4) Sources of Income (Wages, Public Assistance, Both); (5) Family Structure (Two-Parent Nuclear Family, Single-Parent Family, Single-Parent Extended Family); and (6) Family Functioning, based on the St. Paul Profile of Family Functioning.

Results and Discussion

Before summarizing the major findings in the study, we will briefly describe the demographic and initial characteristics of the infant day care sample. The children were about equally divided in terms of sex. About 90% of the children were Black or Hispanic, with a somewhat higher proportion of Black than Hispanic children.

In regard to the families' socio-economic status and economic resources, about 90% of the families were in Hollingshead's two lowest classes, IV and V, with approximately half of the families in each of these classes. About 70% of the families were totally self-supporting before the children entered the day care program, about 16% were completely dependent on public assistance, and 14% received income from both wages and public assistance. The initial Mean total annual rate of income of the families in the study was about $7,400.

The families tended to be of average size. About 90% of the families had 5 or fewer people; about 90% had 3 or fewer children; and 40% of the sample children had no siblings. About 80% of the mothers were in the 19 to 34 optimal child-bearing age, 10% of the mothers were under 19 and 10% were over 34 years of age.

In regard to physical health, approximately 40% of the children had one or more birth complications, including low birth weight. About 65% of the children had no medical problems, 22% had minor problems, and 12% had serious medical problems when they first entered the day care program.

In most of the foregoing respects, the study sample was representative of low-income minority children, who make up the bulk of the population in public day care programs in New York City, as well as comparable children who were not in a day care program. The Group Day Care, Family Day Care, and Cross-Sectional samples differed in very few respects before they entered the day care program. Initial differences that were present among the three samples to be compared were statistically controlled in subsequent analyses of the data, when it was appropriate to do so.

The major findings in the three major areas studied were as follows:

1. Children's Nutrition, Physical Health, and Growth

Since most of the medical problems which we were able to assess on the basis of pediatric examinations were unlikely to be affected by children's infant day care experience, we did not study the programs' effects on children's physical health. However, we compared the group and family day care programs in terms of the nutrition, physical safety, and health care provided to children in the two programs.

At 12, 18, and 24 months of age, the nutrition children received in day care was significantly better in group than in family day care. Children in group day care were provided with more positive nutritional foods during the noon meal and snacks than children in family day care; whereas children in family day care were provided with more negative nutritional food than children in group day care (i.e. junk food and food unsuitable for babies, such as luncheon meats, soda, potato chips, sweets, etc.)

We believe that these findings can be explained in terms of differences in the New York City Health Department's role and structural differences between the two types of infant day care programs. In group day care the food provided to children is supervised by the NYC Health Department, which also licenses group day care centers in the city. Day care centers are required to submit menus to the Health Department, which scrutinizes them for their nutritional value. The family day care programs, on the other hand, are licensed by the New York State Department of Social Services, which requires only that a hot meal and two snacks must be provided to children in full-time day care.

Furthermore, in group day care it is much easier to control the type food provided to children, since this decision is usually made by one person, the Director, in consultation with nutrition specialists from the Health Department. On the other hand, it is much more difficult for the Director of a family day care program to control the food served to children in the 50 or so family day care homes affiliated with the program. In family day care, the food provided to children on a day-to-day basis is largely determined by the hundreds of individual provider-mothers, who probably feed the children under their care the same food they give their own children.

When these findings were discussed at a meeting of the Study Policy Committee, which included representatives of all of the day care programs in the study, the participants expressed the view that while more money for food allowances in family day care may be necessary, money alone will not solve the problem. Junk food can be costly! Family day care provider-mothers may need further training in shopping for relatively inexpensive, nutritious foods in their communities, and eliminate the kinds of foods which are not particularly nutritious or suitable for babies. In addition, closer supervision of this aspect of the family day care programs may be necessary.

In regard to physical safety, there were significantly fewer safety hazards in group day care centers than in family day care homes; but there were no differences in the safety practices of caregivers with children in the two types of infant day care programs.

In regard to the quality of health care, the group day care programs were significantly better than the family day care programs in terms of the adequacy of children's immunizations, the agencies' knowledge of children's medical problems, and follow-up of medical problems which we had reported.

Children in the two types of infant day care programs did not differ greatly in the adequacy of their immunizations when they first entered the program, but by three years of age, whereas the group day care children continued to be properly immunized, the percentage of children in family day care who were properly immunized had decreased sharply. When they first entered the program, 86% of the group day care children and 68% of the family day care children had excellent or satisfactory immunizations. By age three, however, 84% of the group day care children and only 29% of the family day care children had excellent or satisfactory immunizations.

The two types of infant day care programs did not differ greatly in their knowledge of children's initial medical problems. By the time the children were three years of age, both types of day care programs declined in this respect, but the family day care programs declined further than the group day care programs. The major reason for the day care agencies' lack of knowledge of children's current medical problems was due to the fact that there was no evidence of a recent pediatric examination in children's health records. By age three, approximately 50% of the group day care children and 80% of the family day care children apparently did not have a pediatric examination during the past six months.

Follow-up of reported medical problems was fairly poor for both types of infant day care programs, but it was better in group than in family day care. We had reported medical problems on 140 children to 10 group day care programs and 19 family day care programs. Whereas 8 of the 10 group programs contained some record of problems which we had reported, only 4 of the 19 family day care programs had any record of the medical problems which we had reported. However, 37% of the cases reported to the group programs were contained in children's health records, but only 19% of the cases reported to the family day care programs were contained in children's health records. Further follow-up on these problems (viz referral to children's regular source of health care for more diagnostic work-up or treatment) was even less adequate in both types of infant day care programs.

The differences in the quality of health care provided to children in the group and family infant day care programs may also be attributed to differences in the role the NYC Health Department plays in the two types of day care programs. While both kinds of day care programs are funded and operated under the auspices of the NYC Agency for Child Development (ACD), the Health Department plays a more direct and active role in the group than in the family day care programs. In addition to licensing the group day care programs, the Health Department supervises or provides direct pediatric services to children in day care centers, which includes age-appropriate immunizations and a regular schedule of routine pediatric examinations. The group infant day care programs are also required to maintain comprehensive, up-to-date health records on each child. The Health Department has considerable leverage on the group day care programs. In considering applications for renewing licenses, which are required once a year in the group infant day care programs, the quality of health care provided to children and completeness of medical records are taken into account. On the other hand, the NYC Health Department's role in the family day care programs is minimal. The family day care programs either make their own arrangements for pediatric care, or leave this responsibility to each child's family.

The difference in the quality of health care in the two types of infant day care programs can be seen most clearly in the adequacy of children's immunizations, a particularly sensitive indicator of the quality of preventive health care provided to infants. Most children in both programs were up-to-date on their immunizations and the two programs did not differ greatly in this respect when the children first entered the program. This was probably due to the fact that before children can be accepted into a licensed day care program, they must have a recent pediatric examination and be up-to-date on their immunizations. While the children in group day care continued to be properly immunized after they entered the program, the family day care programs were grossly inadequate in this respect.

On the basis of these findings, both types of infant day care programs can be improved. But the family day care programs may need to reconsider their role in the nutrition and health care provided to children, as well as their relationship to the New York City Health Department.

Children's Psychological Experiences and Development

The play materials, equipment, and play space available to children at 12, 18, and 24 months of age were significantly better in group than in family day care. However, these physical characteristics of the infant day care programs did not seem to be related to any aspect of children's later psychological development at three years of age.

While group day care was superior to family day care in the foregoing physical aspects of the program, whenever there were differences between the two types of infant day care programs in the social aspects of the program, they consistently favored family over group day care. The caregiver-child ratios were significantly higher in family than in group day care, although the ratios in both programs were less than three children per caregiver. The ratios we observed may have underestimated the actual caregiver-child ratios in these programs, since we only counted the number of children who were present and awake at the time the estimates were made. However, differences in caregiver-child ratios were not related to any aspect of children's psychological development at 36 months of age. We believe that this was due to the fact that the ratios tended to be quite high and varied very little in the programs we studied, because they were required to maintain stringient standards in this respect in order to be licensed. In order to determine the effect of caregiver-child ratio on children's psychological development, it would be necessary to study day care programs which differed greatly in this respect.

We also found that children in family day care received significantly more individual attention from caregivers than children in group day care, and differences in the amount of individual attention children received correlated significantly with their Social Competence with Adults at three years of age.

While there were quantiative differences between the two types of infant day care programs in the amount of individual attention children received, the group and family day care programs did not differ significantly in the quality of the caregiver's behavior with children. The two programs did not differ in the amount of cognitive-language stimulation or positive social emotional stimulation children received from caregivers; nor were there significant differences in these aspects of children's behavior, with one exception: at 12 months of age, children in family day care manifested higher levels of cognitive-language functioning in their natural day care setting than group day care children.

While there were essentially no qualitative differences between the group and family day care programs in the way caregivers interacted with children or in children's behavior, individual differences in these respects were related to children's Language Competence, Social Competence with Adults, and Adequacy of Emotional Functioning at three years of age.

The aspects of children's psychological experiences in infant day care which we studied at 12, 18, and 24 months of age did not seem to be related to their later performance on standard tests, such as the Stanford-Binet or Peabody Picture Vocabulary Test, or their Cognitive Style and Social Competence with Peers at three years of age.

While group day care children obtained significantly higher IQ scores than similar home-reared children at 18 and 36 months of age, family day care children did not differ significantly from comparable home-reared children in their intellectual development at these ages.

Although the group and family day care children did not differ in the development of sensorimotor intelligence during the first 18 months of life, by three years of age the group day care children obtained significantly higher scores than the family day care children on the Stanford-Binet, a measure of verbal intelligence. This is similar to the pattern one finds in studies of social class differences in intellectual development, were SES differences in IQ also first emerge between 18 and 36 months of age, a period of rapid language growth.

Whereas the group day care children maintained about the same level of intellectual performance between 18 and 36 months of age, the family day care children declined in their intellectual performance after 18 months, and did not differ in IQ at three years of age from comparable home-reared low-income children. At 36 months the group day care children obtained a mean IQ of 99, while the family day care and cross-sectional home-reared children obtained Mean IQ's of about 92, a highly significant though moderate difference.

While the group day care programs succeeded in preventing the decline in intellectual development usually manifested by low-income children after 18 months of age, the family day care programs were not as successful in this respect, despite the fact that trained education aides visited each family day care home twice a week to stimulate children's cognitive development.

The superiority of the group infant day care children at three years of age was only manifested in children's performance on the Stanford-Binet Intelligence Scale. There were no differences among the group day care, family day care, and cross-sectional home-reared children on any other 36 month psychological measure.

Since the group and family infant day care programs did not differ in the amount of cognitive-language stimulation children received from caregivers during the first two years of life, we were not able to identify the infant day care experiences which contributed to the IQ differences between children in the two types of day care prorams at three years of age. It is possible that there were differences between the group and family day care programs between 24 and 36 months of age, which we did not study, that may have contributed to the IQ differences at three years of age. One important factor which may account for the IQ differences between the group and family day care children at 36 months of age is that in the group programs the Head Teacher of the 2-3 year old children must be a licensed nursery school teacher, which is not the case for the younger children. The professional teachers in the 2-3 year old groups may have provided children with the kind of academically-oriented learning experiences which facilitated children's performance on the Stanford- Binet and prepare them better for school.

It is possible that if professional teachers were in charge of younger children, IQ differences between the group and family day care children may have manifested themselves earlier than three years of age. However, on the basis of research in model day care centers, where children receive a great deal of cognitive and language stimulation, the effects of this experience on the intellectual development of low-income children generally do not manifest themselves until after 18 months of age.

The age when children entered the day care proram, ranging from 2 to 21 months, was not related to any aspect of children's psychological development at three years of age. Children who entered day care during the first year of life did not differ in their psychological development at three years of age from children who entered the program during the second year.

On the basis of a longitudinal study of several hundred children in 31 relatively new, service-oriented public and private licensed group and family infant day care programs, we have demonstrated that low-income children with several years of infant day care experience in such programs develop as well and in some respects develop better than comparable home-reared children during the first three years of life. In general, children in group and family infant day care programs did not differ in their psychological development, except for the IQ differences at three years of age.

Children in family day care received more individual attention from caregivers during the first two years of life than group day care children, and differences in amount of attention correlated with how well children related to adults at three years of age. While the two types of day care programs differed quantitatively in the amount of individual attention children received, there were no qualitative differences in cognitive language stimulation or social-emotional stimulation provided by caregivers to children in the two programs. However, differences in these respects correlated with children's every day use of language, how well they related to adults, and how well they coped with feelings at three years of age.

On the basis of these findings, we would conclude that the quality of care children receive in day care during the first two years of life may be more important than whether the care is provided in a day care center or a family day care home.

Family Development

The infant day care programs we studied did not have any measurable immediate or long-term effects on families, in terms of their socio-economic status, total income, income from wages, sources of income, family structure, or general functioning. While there were increments in some of these respects, the changes were not related to the type of day care program or length of time in the program. Differences among the group day care, family day care, or cross-sectional families which existed before the children entered the program were also present after the children had been in the program for varying lengths of time, ranging from one month to several years.

It is our impression that families use infant day care services, much as they may use other community resources for their children, such as schools, but they do not seem to be greatly affected by these programs, in terms of their socio-economic status, economic resources, structure, or functioning.

It is also our impression that infant day care programs are primarily used by poor working families, where the parents work whether public day care facilities are available for their children or not. If public infant day care facilities are not available, the families make private child-care arrangements, which are often unsatisfactory and relatively costly. In a survey of about 1,300 families who applied for public day care services in New York City in August 1976, we found that 70% of the children, ranging from a few months to 7 years of age, had been in private day care outside of their homes before 2½ years of age, while their parents were working or going to school. About 75% of the children were placed for day care outside of the home during the first year, and half of these during the first six months of life.

Infant day care programs do not seem to get families off welfare, contrary to what many people believe. About 70% of the families we studied were completely self-supporting before the children entered the program, and only about 14% were completely dependent on public assistance. After several years in the program, approximately the same proportion of families were self sufficient or dependent on welfare. While public day care programs generally do not keep welfare families in the program indefinitely, some children are accepted into these programs whose parents may be unable to care for them properly and who remain chronically indigent. But for the most part, infant day care programs largely serve poor working families. The parents work even though they may not earn much more than they would get from public assistance. They work whether infant day care services are available for their children or not. This picture of poor black and Hispanic families runs counter to the stereotypes in the literature about disorganized, minority welfare families.

While infant day care programs did not seem to have any positive or negative effects on families, at least on the variables we studied, we believe that families benefit from such programs in certain important respects which we did not measure. At the very minimum, licensed public infant day care programs provide families with reliable, supervised, low-cost child care for their babies. On the basis of this study, we can now assure families that their children will not suffer adversely from their infant day care experience.

CHAPTER 13 - POLICY RECOMMENDATIONS FOR INFANT DAY CARE

The New York City Infant Day Care Study was a large-scale, interdisciplinary, longitudinal, comparative seven-year study of 31 service-oriented, licensed, public and private, community-controlled group and family infant day care programs, and their effects on approximately 400 children and families.

On the basis of our findings, we are making the following major policy recommendations for infant day care:

I. Meet the Vast Unmet Need for Subsidized, Licensed Infant Day Care

There is a tremendous need for subsidized, licensed, supervised infant day care services, which is not being met now. Bronfenbrenner (1976) reported that in 1974 30% of the married women with children under three years of age in the United States were working; 45% of the single-parent mothers with children under three years were working. There is reason to believe that the percentage of low-income working mothers with infants may be substantially greater.

In a survey which we made of 1,366 families who applied for public day care services in New York City in August 1976, we found that approximately 70% of the children, ranging from a few months to seven years of age, had prior private day care experience outside of their own homes before 2½ years of age, while their mothers were working or going to school. Approximately 75% of these children were placed for private day care outside of their homes during the first year of life, and about half of these infants were separated from their families for prolonged periods of time during the day before six months of age. While 70% of the children whose families applied for public day care services needed day care during the first three years of life, less than 8% of the children in public day care programs in New York City in the Fall of 1976 were under three years of age.

We found that public licensed infant day care services in New York City are largely used by poor minority working families, who are totally self-supporting before they enter the program; who work even though they may not earn much more money than they could obtain from welfare without working; and who work whether public infant day care facilities are available for their children or not.

Because of the critical shortage of licensed infant day care services in New York City, poor working mothers must often place their babies in unlicensed, unsupervised, relatively costly private family day care homes. While a great deal of attention has been paid to the needs of the welfare class in our society, the needs of poor working mothers with infants have frequently been neglected. One of the greatest needs of such families is licensed, supervised, high-quality, low-cost infant day care for their babies.

We can recommend the expansion of infant day care facilities, because our study has shown that on every measure we used, children in infant day care programs did as well or better than comparable home-reared children.

II. Family Day Care for Children Under Two Years of Age

We recommend that family day care be used as the method of choice for expanding infant day care services for children under two years of age, provided that the nutrition, health care, and physical safety aspects of these programs, which our study found to be deficient.are upgraded.

We are not recommending that the small number of licensed public group infant day care programs currently operating under the auspices of the New York City Agency for Child Development (ACD) be closed. These programs can be used as laboratories to develop methods of stimulating children's early cognitive development.

There are several reasons for using family day care as the method of choice for children under two years of age. The current cost of licensed family day care in New York City is less than half the cost of group day care for infants. While the cost of group day care ranges from $100 to $130 a week per infant, the cost of family day care ranges from $40 to $60 a week per infant. Although the cost differential between the two programs would not be as great if the nutrition and health care components of the family day care programs are upgraded, family day care is still likely to remain considerably less costly for infants than group day care. Therefore, by using family day care for children under two years of age, the cost of infant day care can be substantially reduced and low-cost, licensed infant day care services will be available to more children.

Family day care may be more convenient for user-mothers with infants than group day care. It may be easier to place babies in licensed family day care homes near home, whereas the nearest day care center may be relatively far from home.

We found that the only difference between the two types of infant day care programs in children's psychological experiences during the first two years of life, which made a difference to their later psychological development, is that children in family day care received more individual attention from caregivers than children in group day care. There were no differences between the two programs in the amount of cognitive-language or positive social-emotional stimulation provided to children by caregivers during the first two years of life, although individual differences in children's psychological experiences in these respects were related to important aspects of their later psychological development.

During the first 18 months of life, children in group and family day care did not differ in IQ, but by three years of age, group day care children obtained significantly higher IQ scores than family day care children, who did not differ in this respect from similar low-income home-reared children. Since we did not test children at 24 months, we do not know whether the group and family day care children differed in IQ at two years of age. However, the children in the two programs did not differ in cognitive-language or social-emotional functioning in their natural day care setting during the first two years of life, although individual differences in children's social-emotional functioning were related to important aspects of their psychological development at three years of age.

On the basis of these findings, we concluded that the quality of caregiving which children receive during the first two years of life is more important for their later psychological development than whether they are cared for in a day care center or a family day care home. (See recommendation IV for program choice of children two years and older.) While we have found that extensive group infant day care experience does not have any adverse effects on children's psychological development during the first three years of life, there is no evidence that it is better for children's psychological development to obtain such care in a day care center rather than in a family day care home during the first two years of life. Since children receive more individual attention from caregivers in family day care, and since family day care is considerably less costly than group day care for infants, it makes sense to use family day care as the method of choice for expanding infant day care services during the first two years of life.

III. Increased New York City Health Department's Role in Family Day Care

We have found that the group infant day care programs were vastly superior to the family day care programs in terms of nutrition, health care, and physical safety. Children in group day care were provided with more positive nutritional food during the noon meal and snacks, while children in family day care were provided with more negative nutritional food (viz junk food and food unsuitable for infants, such as luncheon meats, soft drinks, potato chips, sweet desserts, etc). The group day care programs were also significantly better than the family day care programs in the adequacy of children's immunizations, the day care agencies' knowledge of medical problems (including the frequency of pediatric examinations), and follow-up of medical problems which we had reported. The difference in the quality of health care provided to children in the two types of infant day care programs can be seen most clearly in the adequacy of children's immunizations. When children first entered the program, 86% of the group day care children and 68% of the family day care children were properly immunized. However, by three years of age, after the children had been in the program for several years, the day care health records indicated that 84% of the group day care children and only 29% of the family day care children were properly immunized! There were also significantly more physical safety hazards for children in family day care homes than in group day care centers.

While structural differences between the group and family infant day care programs may have played a role, we attribute these findings largely to differences in the New York City Health Department's role in these programs. The NYC Health Department licenses all group day care centers in New York City, while funded family day care homes are approved under regulations by the New York State Department of Social Services. The Agency for Child Development does not supervise the nutrition, health care, and physical safety aspects of the family day care programs to the extent that the Health Department supervises the group infant day care programs in these respects. The Health Department requires that licensed day care centers regularly submit menus to be scrutinized for their nutritional value for infants, whereas the food provided to babies in family day care is largely the responsibility of each individual provider-mother. The Health Department also provides direct pediatric care or closely supervises the health care of children in the licensed group infant day care programs, whereas each family day care center makes its own arrangements for children's health care or leaves this responsibility to the child's family. Such arrangements do not guarantee that children in family day care will be provided with proper nutrition or health care.

We recommend that the New York City Health Department assume a more direct role in the nutrition and health care provided to children under two years of age in licensed family day care programs. In addition, we recommend that the Health Department's Bureau of Nutrition assume responsibility for providing nutritional training for provider-mothers of children under two years of age in family day care, and more closely supervising the nutrition provided to infants in licensed family day care homes on an ongoing basis.

While upgrading the family infant day care programs in these respects may increase their cost, we consider that such improvements are essential. In fact, our recommendation that family day care be used as the method of choice for expanding day care facilities for children under two years of age is contingent on improving the nutrition, health care, and physical safety in these programs.

IV. Group Day Care for Children from Two Years of Age

We recommend that group day care be used as the method of choice for expanding day care services for children between two and three years of age. On the basis of our research, we have concluded that the group day care programs can more effectively stimulate children's intellectual development during this period.

We are not recommending that family day care not be used for children over two years of age, but that it be used selectively. It may be more convenient for infants and older children from the same family to be cared for in the same family day care home. If families prefer to keep their children together, they should have this option. Family day care can also be used for older children who may not be ready for a group experience.

We did not find IQ differences between group and family day care children during the first 18 months of life, but by three years of age, group day care children obtained significantly higher IQ scores than family day care children, who did not differ in this respect from comparable low-income home-reared children. While the children in group day care maintained their level of intellectual performance between 18 and 36 months of age, children in family day care showed the usual decline in intellectual performance which low-income children tend to manifest after 18 months of age, when language plays a more important role in learning. In recent comprehensive reviews of infant day care research (Bronfenbrenner et al, 1976; Ricciuti, 1976), the authors reported that low-income children with extensive group infant day care experience developed better intellectually than comparable home-reared children, but the difference in cognitive development generally emerged after 18 months of age. Social class differences in cognitive development also manifest themselves between 18 and 36 months of age (Golden and Birns, 1976).

While we did not find differences between the group and family day care programs in the cognitive-language stimulation children received from caregivers during the first two years of life, we believe that the IQ differences between the group and family day care children at three years of age may have been due to differences in the cognitive stimulation they received from two to three years of age. The Group Teachers for two-year old children in the group day care programs in the study were licensed nursery school teachers, which was not the case for the younger group day care children. The academically-oriented learning experiences which children in group day care received from the licensed early childhood teachers from 24 to 36 months of age may account for the IQ differences between the group and family day care children at three years of age.

In the family infant day care programs we studied, paraprofessional Education Aides visited each family day care home twice a week to train the provider-mothers to facilitate various aspects of children's development, including their cognitive development. This was the major educational component of the family infant day care programs in our study. Sending Education Aides into the family day care homes did not seem to have any measurable effect on children's development, since the family day care children did not differ from comparable home-reared children during the first three years of life in any aspect of their psychological development, including their intellectual functioning.

Since the group day care programs succeeded in preventing the decline in intellectual performance which low-income children generally manifest by three years of age, whereas the family day care programs were not as successful in this respect, we recommend that group day care be used as the method of choice for expanding day care services for children between two and three years of age. This can be accomplished by accepting two-year olds into the several hundred day care centers which operate under the auspices of the New York City Agency for Child Development, which generally do not accept children under three years of age at the present time.

V. Integration of Group and Family Day Care Programs

We have recommended that children under two years of age should be placed into family day care and when the children are about two years of age they should be transferred to a group day care program. Therefore, we believe that it is essential that a mechanism be developed to integrate the two types of day care programs to insure continuity of care for the children in these programs.

The Cluster Family Day Care Program can serve as a prototype to achieve such integration, although certain changes will have to be made to attain this goal. In the Cluster Program, fifteen to twenty family day care homes in a community are administratively linked with a day care center in the area. The family day care homes form a "cluster" around the day care center with which they are affiliated, hence the name "Cluster" Family Day Care Program.

However, while both the group and family day care programs are administered by the Director of the center, the two types of day care programs operate in a parallel fashion, with no real integration between them. We recommend that the group and family day care components of these programs be more fully integrated, so that caregivers and children can more flexibly shift from one program to another. Family day care provider-mothers can receive their initial training by working at the center, and periodically return to the center for further training. When the children in family day care are approaching two years of age, they can spend some time in the family day care home and some time in the center to make the transition from one program to the other more gradual. It would also be desirable if older children in family day care could spend some time at the center each day, where they could be provided with more academically-oriented learning experiences and peer group experiences.

In addition to the foregoing major recommendations, we would like to make some further recommendations:

1. Selection of Caregivers

While the training and supervision of caregivers are essential to insure that children are provided with quality day care, the selection of caregivers may be equally important.

We have found that individual differences in caregivers' behavior with children during the first two years of life made more of a difference to children's later psychological development than whether they were cared for in a day care center or a family day care home. Studies by other people have also identified the specific kinds of behaviors by caregiving adults which facilitate children's development during infancy (Golden and Birns, 1976).

It may be more effective to select women who possess these characteristics than to attempt to train women to develop them. Therefore, we recommend that criteria and screening procedures be developed to select caregivers who are particularly good with babies, in order to improve the quality of caregiving in these programs.

2. Continued Program Evaluation

While it would not be feasible to continue to study day care programs on the scale employed in the Infant Day Care Study, it would be desirable to study selected aspects of these programs on an on-going basis. This may be particularly important when new procedures or training programs are introduced. For example, does the percentage of properly immunized children increase significantly after the NYC Health Department assumes more direct responsibility for providing health services to the family day care programs? Do the methods used to facilitate children's cognitive development, including the training of caregivers, significantly increase the level of children's intellectual functioning? We recommend that new procedures or training programs in both types of day care programs be carefully evaluated to see if they have achieved their stated goals.

3. Follow-Up of New York City Infant Day Care Study

While we studied the effects of different kinds and amounts of infant day care experience on children's development during the first three years of life, it would be desirable to do a follow-up study to assess the more long-term impact of infant day care on children's development when the children are of school age.

We found that several years of infant day care experience, particularly in a group day care setting, did not have any adverse effects on children's psychological development. It is important to see whether such experience during infancy has any detrimental effects on the children when they are older.

We also found that at three years of age the group day care children obtained significantly higher IQ scores than family day care or comparable home-reared children. Does the IQ difference at three years of age, related to different kinds of earlier infant day care experience, make a difference to children's intellectual performance or academic achievement when they are of school age? Or does the difference wash out later, as has often been the case with older pre-school children with Head Start experience?

We also found that individual differences in caregivers' behavior with children during the first two years of life were related to various aspects of their psychological development at three years of age. Are such differences in children's psychological experiences in infant day care related to their psychological development when the children are older?

In order to answer these questions, we recommend that the children in the New York City Infant Day Care Study who were seen at three years of age be evaluated again when they are of school age, in order to assess the more long-term impact of infant day care experience on children's later development.

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